

**TRUST-BUILDING IN THE U.S.-CHINESE NUCLEAR
RELATIONSHIP:
IMPACT OF OPERATIONAL-LEVEL ENGAGEMENT**

A Thesis
Presented to
The Academic Faculty

by

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In Partial Fulfillment
of the Requirements for the Degree
of International Affairs, Science, & Technology in the
Sam Nunn School of International Affairs

Georgia Institute of Technology
December 2014

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ACKNOWLEDGEMENTS

It gives me great pleasure in expressing my gratitude to all those people who have supported me and had their contributions in making this thesis possible. First and foremost, I express my deepest gratitude to my advisor Dr. Adam Stulberg for his constant guidance, support, motivation and untiring help during the course of my PhD. I would not have accomplished this without his very kind encouragement and advice and I could not have imagined having a better advisor and mentor. I am profoundly thankful to Dr. Lawrence Rubin, Dr. Jarrod Hayes, Dr. Michael Salomone, and Dr. Nolan Hertel for their immense knowledge and strong guidance. The entire Sam Nunn School of International Affairs at Georgia Institute of Technology was a second home for me, and all of the faculty, staff and fellow graduate students provided an extremely comfortable, dynamic, and exciting place to study and research. I am thankful to everyone.

I am very grateful to the faculty, staff, and experts at the Managing the Atom Project and the International Security Program of the Belfer Center for Science and International Affairs at Harvard University for their advice and the opportunity to conduct research at the Kennedy School of Government. I deeply appreciate the opportunity to attend various Track II dialogues as part of the Young Leaders Program at the Pacific Forum CSIS.

Last but not least, I would like to thank my parents and family for their tremendous and continuous support throughout the process. Their sacrifice, encouragement, and love will remain my inspiration throughout my life.

This brief acknowledgement can only capture a small fraction of the people who helped and supported me. I send my deepest thanks to all.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS	III
LIST OF TABLES	VIII
LIST OF FIGURES	X
LIST OF ABBREVIATIONS	XI
SUMMARY	XV
CHAPTER ONE: THE THEORY OF ENGAGEMENT AND TRUST-BUILDING	1
Why Is Trust or Trust-building Relevant?	1
Definitions of Trust in Existing Literature.....	5
Trust as Encapsulated Interests	5
Trust as Risk-taking	7
Trust as Bond	8
Trust and International Relations Theories.....	9
A Better Framework for Understanding Trust.....	23
Bottom-Up Engagement and Trust-building	31
Causal Mechanisms	38
Case Studies and Main Argument.....	43
Plan of the Dissertation	49

CHAPTER TWO: CONCENTRATED OPERATIONAL-LEVEL ENGAGEMENT:

THE COMPREHENSIVE TEST BAN TREATY NEGOTIATIONS	52
Previous Chinese Attitudes toward the Nuclear Test Ban	55
China's Arms Control Community before CTBT	57
U.S.-China Operational-Level Engagement.....	59
Operational-Level Engagement and the Emergence of China's Nuclear Arms Control Community	82
Operational-Level Engagement and the Growth of China's Nuclear Arms Control Community	90
Inter-Agency Coordination and Communication Channels.....	102
Bottom-Up Channel of Communication and Influence	108
CTBT Issues Discussed during Operational-Level Engagement.....	118
Major Issues in Official CTBT Negotiations between the United States and China.....	126
Strategic Trust and U.S.-China CTBT Engagement.....	135
Moralistic Trust and U.S.-China CTBT Engagement.....	138
CHAPTER THREE: LONG-TERM OPERATIONAL-LEVEL ENGAGEMENT:	
NUCLEAR STABILITY AND ARMS CONTROL	156
Official High-Level Dialogue	157
Operational-Level Engagement on Nuclear Stability and Arms Control Issues	159
Community Expansion and Capacity Building.....	176
Bottom-Up Communication and Influence.....	196

Strategic Trust.....	211
Moralistic Trust.....	214
CHAPTER FOUR: LONG-TERM OPERATIONAL-LEVEL ENGAGEMENT:	
NUCLEAR NONPROLIFERATION.....	233
Operational-Level Engagement	234
Community Expansion and Capacity Building.....	245
Bottom-Up Influence and Perception Change	260
Strategic Trust.....	277
Moralistic Trust.....	282
CHAPTER FIVE: CONCLUSION.....	
Summary of Findings.....	302
Theoretical Contribution.....	309
Policy Implications	313
REFERENCES	319

LIST OF TABLES

Table 1 Operationalization of Trust.....	26
Table 2 Summary of Major Bilateral Visits between U.S. and Chinese Nuclear Scientific Communities before and during the CTBT Negotiations, 1993–1996.....	58
Table 3 CTBT-Related Cooperative Research Projects under ACE	69
Table 4 Chinese and Foreign Participants in ISODARCO-Beijing Seminar on Arms Control, 1988–2012	91
Table 5 Government Agencies Represented at the Chinese Delegation to the CD	103
Table 6 Interagency Coordination Channels, 1996.....	105
Table 7 Arms Control Research Institutes and Their Bureaucratic Connections	109
Table 8 Influence of Operational-Level Engagement on Official Negotiations on Major CTBT Issues.....	134
Table 9 Safety Features of Nuclear Weapons in the Existing U.S. Stockpile	141
Table 10 Participating Chinese Government Organizations and Nongovernment Institutes in 1998	160
Table 11 Existing Chinese Government and Nongovernment Programs/Organizations that Have A Heavy Focus on Nuclear Arms Control Issues.....	177
Table 12 CITS’s China Exchanges and Training Programs and Its Chinese Partners ...	240
Table 13 Meetings of the CSCAP Study Group on Countering the Proliferation of Weapons of Mass Destruction (WMD Study Group) since 2005.....	243
Table 14 Meetings of the CSCAP Export Controls Experts Group (XCXG) since 2005	243
Table 15 Major Visits and Exchanges between Los Alamos and Chinese Scientists during the Late 1980s and Early 1990s	250
Table 16 Laws and Regulations Established by China on Nuclear Related or Dual-Use Export Controls.....	282

Table 17 Summary of China’s Economic Sanctions against North Korea since Its Third Nuclear Test 300

LIST OF FIGURES

Figure 1 Participants in ISODARCO-Beijing Seminar on Arms Control, 1988–2012	90
Figure 2 Expansion and Pluralization of China’s Arms Control Community as Represented in ISODARCO-Beijing Seminars on Arms Control (2012)	94
Figure 3 China’s Nuclear Arms Control Organization Chart, by the end of CTBT negotiation.....	99
Figure 4 Chinese Open Publications on CTBT.....	112
Figure 5 Number of Chinese Publications on Arms Control Verification, 1949–2013..	117
Figure 6 Participating Chinese Government Organizations and Nongovernment Institutes by 2009.....	161
Figure 7 China’s Nuclear Arms Control Organization Chart, by 2013	179
Figure 8 Number of Chinese Journal Publications on Crisis Management since 1990..	208
Figure 9 Number of Technical Research Articles on Ballistic Missile Defense Penetration	223
Figure 10 China’s Nuclear-Related and Dual-Use Export Control Organization Chart, 2013.....	259

LIST OF ABBREVIATIONS

ACE	U.S.-China Arms Control Technical Exchange Program
ARF	ASEAN Regional Forum
ASCI	Accelerated Strategic Computing Initiative
ASEAN	Association of Southeast Asian Nations
BISS	Beijing Institute of International Strategic Studies
CACDA	China Arms Control and Disarmament Association
CAEP	Chinese Academy of Engineering Physics
CAMEC	China Aerospace Machinery and Electronics Corporation
CASC	China Aerospace Science and Technology Corporation
CASS	Chinese Academy of Social Science
CDSTIC	China Defense, Science, and Technology Information Center
CEES	Center for Energy and Environmental Studies
CFISS	China Foundation for International & Strategic Studies
CICIR	China Institutes of Contemporary International Relations
CIIS	China Institute of International Studies
CISS	China Institute of International Strategic Studies
CISAC	Committee on International Security and Arms Control
CISAC	Center for International Security and Arms Control; Center for International Security and Cooperation
CITS	Center for International Trade and Security
CLL	U.S.-China Lab-to-Lab Technical Exchange Program
CNEIC	China Nuclear Energy Industry Corporation
CNNC	China National Nuclear Corporation
CNS	Center for Nonproliferation Studies
COSTIND	Commission of Science, Technology, and Industry for National Defense
CPAPD	Chinese People's Association for Peace and Disarmament
CPC	Communist Part of China
CPGS	Conventional Prompt Global Strike

CSCAP	Council for Security Cooperation in the Asia Pacific
CSGAC	Chinese Scientists Group on Arms Control
CSIS	Center for Strategic and International Studies
CTB	Comprehensive Test Ban
CTBT	Comprehensive Test Ban Treaty
CTBTO	Comprehensive Nuclear-Test-Ban Treaty Organization
CWC	Chemical Weapons Convention
DF	Dongfeng
DOE	Department of Energy
DTRA	Defense Threat Reduction Agency
EMP	electro-magnetic pulse
ENDS	Enhanced Nuclear Detonation Safety
FAS	Federation of American Scientists
FRP	Fire-Resistant Pit
GSETT	Group of Scientific Experts Technical Test
IAEA	International Atomic Energy Agency
IAPCM	Institute of Applied Physics and Computational Mathematics
IAS	Institute of American Studies
IBM	International Business Machines Corporation
ICBM	Inter-Continental Ballistic Missile
IHE	Insensitive High Explosive
IMS	International Monitoring System
INER	Institute for Nuclear Energy Research
INMM	Institute of Nuclear Materials Management
ISODARCO	Italian International School on Disarmament and Research on Conflicts
ISS	Institute of Strategic Studies
JL	Julang
LANL	Los Alamos National Laboratory
LLNL	Lawrence Livermore National Laboratory
MAD	Mutually Assured Destruction

MFA	Ministry of Foreign Affairs
MIRV	Multiple Independently-Targeting Reentry Vehicle
MIT	Massachusetts Institute of Technology
MOFCOM	Ministry of Commerce
MPC&A	Materials Protection, Control and Accounting
MPS	Ministry of Public Security
MSS	Ministry of State Security
MTCR	Missile Technology Control Regime
NAS	National Academy of Sciences
NDA	Nondestructive Assay
NDU	National Defense University
NFU	No First Use
NINT	Northwest Institute of Nuclear Technology
NNWS	Non-Nuclear Weapon States
NPS	Naval Postgraduate School
NPT	Nuclear Nonproliferation Treaty
NRDC	Natural Resources Defense Council
NSA	Negative Security Assurance
NSG	Nuclear Suppliers Group
NTB	Nuclear Test Ban
NTM	National Technical Means
OSI	On-Site Inspection
PALEN	Préparation à la limitation des essais nucléaires, Preparation for the Limitation of Nuclear Testing
PLA	People's Liberation Army
PNE	Peaceful Nuclear Explosion
PRC	People's Republic of China
PSI	Proliferation Security Initiative
PSNSS	Program on Science and National Security Studies
PTBT	Partial Test Ban Treaty
SASTIND	State Administration for Science, Technology and Industry for

	National Defense
SBSS	Science Based Stockpile Stewardship
SBU	Stony Brook University
SDI	Strategic Defense Initiative
S&ED	Strategic and Economic Dialogue
SGS	Program on Science and Global Security
SLBM	Submarine Launched Ballistic Missile
SLCM	Submarine Launched Cruise Missile
SM	Standard Missile
SNL	Sandia National Laboratory
SSAC	Systems of Accounting and Control
SSD	Strategic Security Dialogue
SSMP	Stockpile Stewardship and Management Program
START	Strategic Arms Reduction Treaty
TNT	Trinitrotoluene
UCS	Union of Concerned Scientists
USCSCAP	U.S. Committee, Council for Security Cooperation in the Asia Pacific
USPID	Italian Union of Scientists for Disarmament
WINS	China-Washington Intensive Nonproliferation Seminar
WMD	Weapons of Mass Destruction
XCXG	CSCAP Export Controls Experts Group

SUMMARY

The United States and China have been conducting extensive operational-level engagement on nuclear arms control and nonproliferation issues for more than three decades. Many policy-makers and analysts are wondering whether such engagement has contributed in any way to more trust in the two countries' nuclear relationship. The core question that this research seeks to address is: does operational-level engagement between the United States and China increase China's trust towards the United States in their nuclear relationship? And if so, why is this the case and how does this take place?

This research distinguishes strategic trust from moralistic trust. The former type of trust is based on recognition of common interests and the latter derives from recognition of shared moral principles. This research fills the gap in existing international relations research that does not answer the question of whether and how trust arises between states that do not imagine or understand there to be common interests or shared moral principles at the inception of engagement. Realist theories reject the issue of trust as a meaningful concept; neoliberals focus on redressing transaction costs to achieve common interests and they both see national interests as commonly understood and predetermined; constructivists, while acknowledging that identity affects perception of national interests, tend to focus on separate moments rather than analyzing what drives perception change during an extensive time period. This research traces an incremental process of convergence towards recognizing common interests between states that at first do not conceive of such common interests. It examines whether operational-level engagement is able to help states recognize and develop common interests and/or common moral principles. The research uses three cases in the U.S.-Chinese nuclear engagement to

understand whether interaction at the operational-level can ultimately bring about convergence of perception at the top-level through building of epistemic community and bottom-up communication.

The primary finding of this research is that U.S.-Chinese operational-level engagement did increase strategic trust at the top level but did not increase moralistic trust. For strategic trust, the case studies show that operational-level engagement played an important role in building and growing China's nuclear community and helped them develop a common vocabulary with their American counterparts; such engagement was necessary for the Chinese nuclear community to learn, accept, internalize, and spread American nuclear arms control and nonproliferation concepts and theories; such engagement helped the Chinese nuclear community develop a much better inter-agency coordinating mechanism and helped them develop direct and indirect bottom-up communication channels that have been effective in promoting perception change at the top-level; such bottom-up driven perception change helped the Chinese to recognize more common interests with the United States and to become increasingly motivated to cooperate with the United States to achieve these newly-identified common interests; operational-level engagement also played an important role in building up the technical capacity of the Chinese nuclear community, making it easier for the two countries to achieve the newly-identified common interests.

As for moralistic trust, the case studies show that operational-level engagement actually makes the Chinese nuclear community believe that the U.S. nuclear policy-making is guided by a few principles – none of which overlaps with China's traditional nuclear moral/normative principles; operational-level engagement reveals and reinforces the

identity gap between China and the United States – the Chinese nuclear principles are based on their identification with the developing countries rather than the United States; operational-level engagement convinces the Chinese nuclear community that they should follow *realpolitik* principles in their nuclear policy-making and should give less consideration to moral/normative principles, thus undermining the basis for building “moralistic trust” between the two countries.

The same findings hold true for both long-term operational-level engagement (the cases on U.S.-Chinese engagement on nuclear stability and arms control and U.S.-Chinese engagement on nuclear nonproliferation) and concentrated operational-level engagement (the case on CTBT). These case studies represent a comprehensive and systematic study of all the major operational-level engagement between the two countries on nuclear issues and have important theoretical and policy implications.

CHAPTER ONE

THE THEORY OF ENGAGEMENT AND TRUST-BUILDING

Why Is Trust or Trust-building Relevant?

The need for studying the issue of trust building is driven by important, real policy problems facing foreign policy decision-makers everywhere in the world. Many prominent policymakers and senior experts argue that trust is essential for fostering cooperation and avoiding conflict between nation-states and that lack of trust hampers progress on important foreign and security policy issues.¹ In the U.S.-China nuclear relationship, the two countries have been able to carry out a number of successful cooperative actions on important nuclear arms control and nonproliferation issues (such as the drafting of Comprehensive Test Ban Treaty and joint action to counter regional proliferation).² But numerous senior U.S. and Chinese decision-makers and analysts still complain about lack of trust as the biggest obstacle to the two countries developing a

¹"Building U.S.-China Trust through Next Generation People, Platforms, and Programs," (U.S.-China Bi-National Commission, USC Annenberg School for Communication and Journalism, Peking University School for International Studies, 2013); "Trust-Building Process on the Korean Peninsula," (Seoul: Ministry of Unification, Republic of Korea, 2013); Jinping Xi, "New Asian Security Concept for New Progress in Security Cooperation: Remarks at the Fourth Summit of the Conference on Interaction and Confidence Building Measures in Asia," (Shanghai Expo Center 21 May 2014).

²Lewis A. Dunn et al., "Building toward a Stable and Cooperative Long-Term U.S.-China Strategic Relationship (构建长期稳定、合作的中美战略关系)," (Science Applications International Corporation (科学应用国际公司), The Pacific Forum CSIS (战略与国际问题研究所太平洋论坛), and China Arms Control and Disarmament Association (中国军控与裁军协会), 2012); Nikita Perflyev, "The Ctbdt and Strategic Relations between Russia, China and the United States" (Program on Strategic Stability Evaluation, Georgia Institute of Technology, Center for Nonproliferation Studies, 2012); Jingping (李静平) Li, "A Preliminary Analysis on U.S.-China Strategic Stability: Constructing U.S.-China Strategic Stability Beyond Strategic Weapons (中美战略稳定初探——超越战略武器看中美战略稳定的构建)," in *13th PIIC Beijing Seminar on International Security* (Beijing: Program for Science and National Security Studies (PSNSS), 2012).

stable and constructive nuclear relationship.³ For instance, although the Chinese strongly believe and repeatedly claim that they would never need or intend to build a nuclear arsenal as large and powerful as that of the United States, the United States still very much skeptical that China might choose to “sprint to parity” and massively build up its nuclear forces.⁴ Such concerns have reduced U.S. interests in pursuing further nuclear reductions or engaging with China on nuclear arms control cooperation. Similarly, China has always been skeptical about the real intentions behind the U.S. development and deployment of missile defense systems globally and in the Asia Pacific region in particular.⁵ Such skepticism has prevented the two countries from reaching agreement on how to improve nuclear stability between them and in the region more broadly.⁶ Because of such suspicions and mistrust, both countries base their nuclear policymaking on worst-case scenarios, which reinforces threat perceptions and leads to persistent high-level expenditures on nuclear-related defense projects that do not seem to fit with the overall bilateral and global environment in the twenty-first century.

In spite of the need for better understanding about trust and trust building, the concept of trust is understudied in the field of international relations (IR). Questions such as what it means for states to trust, what the relationship between trust and cooperation is, how is

³ See, for example, Elbridge A. Colby and Abraham M. Denmark, "Nuclear Weapons and U.S.-China Relations: A Way Forward - a Report of the Poni Working Group on U.S.-China Nuclear Dynamics," (Washington DC: Center for Strategic and International Studies, 2013); Kenneth Lieberthal and Wang Jisi, "Addressing Us-China Strategic Distrust," (John L. Thornton China Center at Brookings, 2012).

⁴ Gregory Kulacki, "China's Nuclear Arsenal: Status and Evolution," (Boston, MA: Union of Concerned Scientists, 2011); James M Acton, "Bombs Away? Being Realistic About Deep Nuclear Reductions," *The Washington Quarterly* 35, no. 2 (2012); Brad Roberts, "Asia's Major Powers and the Emerging Challenges to Nuclear Stability among Them," (DTIC Document, 2009).

⁵ Keir A Lieber and Daryl G Press, "The Rise of Us Nuclear Primacy," *Foreign Affairs* (2006); Wu Riqiang, "China's Anxiety About Us Missile Defence: A Solution," *Survival* 55, no. 5 (2013).

⁶ Gregory Kulacki, "Chickens Talking with Ducks: The Us-Chinese Nuclear Dialogue," *Arms Control Today* 41(2011).

trust detected and measured in interstate relations, how trust might emerge in an anarchic environment in the first place, and how it might grow, still do not have satisfactory answers.

Moreover, analysts have argued that mutual trust can be built through bilateral engagement.⁷ The strategic engagement theory, for example, argues for using engagement to change and manipulate perception and behavior.⁸ Political leaders also call for bilateral dialogues and exchanges as a means to “increase mutual trust” and “remove prejudices, and differences” because “these exchanges give folks a chance to be able to have a deeper understanding of each other... and eventually that understanding can grow into trust.”⁹ In particular, some analysts claim that extensive bilateral engagement at operational levels between people who know and work on the issues on a day-to-day basis can help build interstate trust.¹⁰ According to this argument, growth of trust at the operational level can influence thinking at higher levels (e.g., the level of national decision-makers) and can lead to increase of trust at high levels.¹¹ However, there has been no empirical research to support this argument. In the case of the U.S.-China nuclear relationship, despite decades of operational-level bilateral mutual engagement, people still very often complain about the so-called “trust deficit” and argue

⁷Yongjin Zhang, *China in International Society since 1949: Alienation and Beyond*(Macmillan Basingstoke, 1998); David Shambaugh, "China's Military Views the World: Ambivalent Security," (2006).

⁸Marc Lynch, "Why Engage? China and the Logic of Communicative Engagement," *European Journal of International Relations* 8, no. 2 (2002); Elizabeth Economy and Michel Oksenberg, *China Joins the World: Progress and Prospects*(Council on Foreign Relations, 1999).

⁹John Kerry, "Remarks at the Closing Session of the 2013 U.S.-China High-Level Consultation on People-to-People Exchange,"(Washington, DC: U.S. Department of State, November 21, 2013).

¹⁰Bin Li, "Promoting Effective China-U.S. Strategic Nuclear Dialogue,"(Washington DC: Carnegie Endowment for International Peace, October 18, 2011).

¹¹Zhe Sun, "Building a Security Community in the Asia-Pacific Region: Dilemmas and Prospects,"(Tokyo: The Tokyo Foundation, 2012); Nicholas J. Wheeler, "The Challenges to Trust-Building in Nuclear Worlds Project Practitioners Meeting Report,"(The House of Commons, Members' Dining Room: David Davies Memorial Institute of International Studies, February 2010).

that “trust deficit” is causing serious problems.¹² Many people have put their hope for a better U.S.-China nuclear relationship in the assumption that operational-level engagement will gradually remove mistrust and increase trust at both the operational and decision-making levels. The problem is, it does not appear that the so-called bottom-up engagement actually repairs the “trust deficit” or leads to more trust. Especially for people who argue that trust results from enhanced communication, engagement, transparency, and information sharing,¹³ it is really puzzling that although U.S. nuclear policies and the policy-making process have been relatively transparent, decades of bilateral interaction with China still have not persuaded Beijing to have more faith in Washington’s benign intentions. It is, therefore, necessary to ask the questions, what is the real impact of operational-level engagement on trust building? And are we wrong in expecting growth in trust as a result of bottom-up engagement?

For the purpose of shedding light on these issues, this dissertation seeks to address this specific question: does operational-level engagement between the United States and China increase China’s trust toward the United States in their nuclear relationship? And if so, why is this the case and how does this take place? This research seeks to first clarify the meaning of trust in the context of the U.S.-China nuclear relationship and to then

¹²Lynch, "Why Engage? China and the Logic of Communicative Engagement."; Ralph Cossa, Brad Glosserman, and David Santoro, "Progress Continues, but Disagreements Remain: The Seventh China-US Strategic Dialogue on Strategic Nuclear Dynamics & the Inaugural China-US Dialogue on Space Security," in *Issues & Insights*(Beijing, People's Republic of China: China Foundation for International and Strategic Studies (CFISS), Pacific Forum CSIS, January 2013).

¹³Dunn et al., "Building toward a Stable and Cooperative Long-Term U.S.-China Strategic Relationship (构建长期稳定、合作的中美战略关系)."; "Transparency and Confidence-Building Measures in Outer Space Activities," in *Study Series 34*(New York: United Nations, 2013); Des Browne et al., "Building Mutual Security in the Euro-Atlantic Region,"(Washington DC: Nuclear Threat Initiative, 2013); "Building U.S.-China Trust through Next Generation People, Platforms, and Programs."

examine the connection between operational-level engagement and high-level trust building in this relationship.

Definitions of Trust in Existing Literature

Trust is defined in numerous ways in the existing literature.¹⁴ In general, they can be grouped into three broad categories: trust as encapsulated interests, trust as risk-taking, and trust as bond.

Trust as Encapsulated Interests

In the prisoner's dilemma, mutual defection is the default choice for both actors, and it is the only Nash equilibrium in the game in the sense that both actors prefer defection to cooperation with each other. In the assurance game, however, if one actor thinks the other will cooperate, it prefers to cooperate as well. That is, there is a Nash equilibrium in which both sides cooperate.¹⁵ This confirms the rationalist argument about trust—shared interests are the foundation. As Thomas C. Schelling states, "[W]hether polite or impolite, constructive or aggressive, respectful or vicious, whether it occurs among friends or antagonists and whether or not there is a basis for trust and goodwill, there must be some common interest, if only in the avoidance of mutual damage, and an awareness of the

¹⁴ For discussions of the concept of trust in international relations, see, for example, Aaron M Hoffman, "A Conceptualization of Trust in International Relations," *European Journal of International Relations* 8, no. 3 (2002); Russell Hardin, *Trust and Trustworthiness* (New York: Russell Sage Foundation, 2002); Elinor Ostrom and James Walker, *Trust and Reciprocity: Interdisciplinary Lessons for Experimental Research*, vol. 6 (Russell Sage Foundation, 2005); Margaret Levi and Valerie Braithwaite, *Trust and Governance* (Russell Sage Foundation, 1998); Niklas Luhmann et al., *Trust; and, Power: Two Works by Niklas Luhmann* (Wiley Chichester, 1979); Gregory A Bigley and Jone L Pearce, "Straining for Shared Meaning in Organization Science: Problems of Trust and Distrust," *Academy of Management Review* 23, no. 3 (1998).

¹⁵ Andrew H Kydd, *Trust and Mistrust in International Relations* (Princeton University Press, 2005).

need to make the other party prefer an outcome acceptable to oneself.”¹⁶ According to rationalists’ understanding of the concept, actors trust on the basis of beliefs about others’ interests.¹⁷ Actors trust others when they believe that others’ interests “encapsulate” their own. Trust is a belief that potential partners have self-interest in cooperation.¹⁸ This concept of trust is based on a cold, sober evaluation of the advantages and disadvantages of trust—or, according to Hardin, it is a “matter of prudential assessment, not moral choice.”¹⁹

Wheeler and Booth see this type of trust as “functional cooperation.”²⁰ Rationalists such as Keohane, Olson, Uslaner, and Stein claim that trust is limited and situational.²¹

“Actors trust specific others in particular contexts in which they have enough relevant information about interests. Trust is confined to particular situations but not generalized beyond.”²² In these situations, actors do not make judgments about others’ inherent trustworthiness; instead they explain and predict behavior according to situational circumstances.²³ Accordingly, actors might have an incentive to cooperate in one area but to defect in another.

¹⁶Thomas C Schelling, "The Diplomacy of Violence," *Essential Readings in World Politics* 2(1966).

¹⁷Brian C Rathbun, *Trust in International Cooperation: International Security Institutions, Domestic Politics and American Multilateralism*(Cambridge University Press, 2012).

¹⁸Russell Hardin, "Trust (Key Concepts)," *Polity* (2006).

¹⁹"Conceptions and Explanations of Trust," *Trust in society* 2(2001); "Trust (Key Concepts)."

²⁰Ken Booth and Nicholas Wheeler, *The Security Dilemma: Fear, Cooperation, and Trust in World Politics*(Palgrave Macmillan, 2008).

²¹Robert O Keohane, *After Hegemony: Cooperation and Discord in the World Political Economy*(Princeton University Press, 2005); Mancur Olson, "The Logic of Collective Action: Public Goods and the Theory of Groups, Second Printing with New Preface and Appendix (Harvard Economic Studies)," (1971); Eric M Uslaner, *The Moral Foundations of Trust*(Cambridge University Press, 2002); Arthur A Stein, "Coordination and Collaboration: Regimes in an Anarchic World," *International Organization* 36, no. 2 (1982).

²²Rathbun, *Trust in International Cooperation: International Security Institutions, Domestic Politics and American Multilateralism*.P. 13.

²³Ibid.

Trust as Risk-taking

A number of scholars point out that trusting others involves making predictions about their future actions.²⁴ Despite the existence of “encapsulated interests,” it is always difficult for the trustor to completely rule out the possibility that the trustee might still choose to act against the “encapsulated interests.” Actors that entrust their interests to others always run the risk of betrayal.²⁵ As a result, some scholars claim that trust and uncertainty/risk are interconnected. According to them, trust always develops under conditions of uncertainty and never completely escapes it.²⁶ If actors had 100 percent certainty in a relationship, they would not need trust; trust would become an irrelevant concept.²⁷ In this sense, Jonathan Mercer claims that what defines trust is “certainty beyond observable evidence.”²⁸ In essence, trust involves the willingness to take risks.²⁹

Trust as Bond

Rationalist accounts of trust in IR are attacked for overlooking some of its key social properties.³⁰ Social psychologists point out that the key to building trust lies in individuals developing common identifications and ties, leading to a strong sense of

²⁴Luhmann et al., *Trust; and, Power: Two Works by Niklas Luhmann*; Adam B Seligman, *The Problem of Trust*(Princeton University Press, 2000); Diego Gambetta, "Can We Trust Trust," *Trust: Making and breaking cooperative relations* (2000).

²⁵Seligman, *The Problem of Trust*; James S Coleman and James Samuel Coleman, *Foundations of Social Theory*(Harvard University Press, 1994).

²⁶Barbara Misztal, *Trust in Modern Societies: The Search for the Bases of Social Order*(John Wiley & Sons, 2013); Booth and Wheeler, *The Security Dilemma: Fear, Cooperation, and Trust in World Politics*; Emanuel Adler and Michael Barnett, *Security Communities*(Cambridge University Press, 1998).

²⁷Martin Hollis, *Trust within Reason*(Cambridge University Press, 1998); J David Lewis and Andrew Weigert, "Trust as a Social Reality," *Social forces* 63, no. 4 (1985).

²⁸Jonathan Mercer, "Rationality and Psychology in International Politics," *International Organization* 59, no. 1 (2005).

²⁹Hoffman, "A Conceptualization of Trust in International Relations."

³⁰Hollis, *Trust within Reason*; Booth and Wheeler, *The Security Dilemma: Fear, Cooperation, and Trust in World Politics*.

group identity.³¹ Their arguments suggest that trusting interstate relationships develop when leaders perceive that they and their counterparts in potential trustee states are members of the same social group or groups.

In existing literature, shared identity is one of the most frequently cited causes of close relationships.³² According to the social identity theory, the more individuals “see themselves in terms of their shared similarities with other members of particular social categories, the more likely they are to engage in in-group favoritism and out-group discrimination.”³³ Common group membership creates a sense of obligation among members that “develops out of identification with the group and group values.”³⁴ The obligations group members feel toward one another as a result of their commitment to group values inhibit their willingness to take advantage of gains that come at each other’s expense.

Trust and International Relations Theories

Scholars have used various ways to define trust in the existing literature, but not many of them have systematically explored the concept of trust and especially its relationship with mainstream IR theories. This section provides a review about how trust is understood

³¹*The Security Dilemma: Fear, Cooperation, and Trust in World Politics*; Marilynn B Brewer, "The Social Psychology of Intergroup Relations: Can Research Inform Practice?," *Journal of Social Issues* 53, no. 1 (1997); Paul Seabright, *The Company of Strangers: A Natural History of Economic Life (Revised Edition)*(Princeton University Press, 2010).

³²Adler and Barnett, *Security Communities*; Alexander Wendt, "Collective Identity Formation and the International State," *American political science review* 88, no. 2 (1994).

³³Aaron Michael Hoffman, "In States We Trust: The Evolution and Decline of Trusting Relationships in the United States, 1776--1860, and the European Community, 1950--1986" (Ph.D., University of Pittsburgh, 2001); Russell Spears, Bertjan Doosje, and Naomi Ellemers, "Commitment and the Context of Social Perception," (1999).

³⁴Tom R Tyler, "Why Do People Rely on Others? Social Identity and Social Aspects of Trust," *Trust in society* 2(2001).

from the perspective of respective mainstream IR theories, how these perspectives relate to each other, and most importantly their limitations.

Research on trust-related issues started in the early 1900s and was first conducted by economists. In his famous book *The Philosophy of Money*, published in 1907, German scholar Georg Simmel claims that trust is one of the most important powers of integration of a society. He states, “Without the general trust that people have in each other, society itself would disintegrate.”³⁵ Since then, the concept of trust has been discussed by a large number of economists who have sought to understand how trust is necessary for any monetary system to work and the role that trust plays in business or trade relationships.³⁶

It was only in the 1970s that the concept of trust was initially examined by a number of sociologists, political scientists, and psychologists, among others.³⁷ Before that, IR scholars did not pay much attention to the issue of trust, even though some early realist philosophers did reveal how they thought about issues related to trust in their works.

Thomas Hobbes, for instance, pointed out that anarchy was the fundamental nature of the international system and implied that mistrust dominates interstate relations. For Hobbes, the state of nature is the state of war.³⁸ Because of the anarchical nature of the international system, there is no place for trust and every state seeks to destroy of the

³⁵Georg Simmel, *The Philosophy of Money*(Psychology Press, 2004).

³⁶Lynne G Zucker, "Production of Trust: Institutional Sources of Economic Structure, 1840–1920," *Research in organizational behavior* (1986); Roger C Mayer, James H Davis, and F David Schoorman, "An Integrative Model of Organizational Trust," *Academy of management review* 20, no. 3 (1995); Deepak Sirdeshmukh, Jagdip Singh, and Barry Sabol, "Consumer Trust, Value, and Loyalty in Relational Exchanges," *Journal of marketing* 66, no. 1 (2002).

³⁷Lewis and Weigert, "Trust as a Social Reality."; Alan Fox, *Beyond Contract: Work, Power and Trust Relations*(Faber & Faber London, 1974); Allan Silver, "Trust in Social and Political Theory," *The Challenge of Social Control* (1985); Shmuel Noah Eisenstadt and Luis Roniger, *Patrons, Clients and Friends: Interpersonal Relations and the Structure of Trust in Society*(Cambridge University Press, 1984).

³⁸Terry Nardin and David Mapel, *Traditions of International Ethics*(Cambridge Univ Press, 1992).

power of anyone else who might pose a threat. “During the time men live without a common power to keep them in awe, they are in that condition which is called war; and such a war as is of every man against every man.”³⁹

The belief of realists is that not everyone is a security seeker and states may be aggressively motivated. As a result, even security seekers have to attack preventively and preemptively to destroy the power of others before they ever become a real threat.⁴⁰ Such a belief is mostly embraced by IR scholars who later came to be known as offensive realists. For offensive realists such as John Mearsheimer, survival is the primary goal of states in an anarchic system. Because there is always uncertainty about the real intentions of other states, mistrust is unavoidable and a permanent background feature of IR.

According to Mearsheimer, “states in the international system fear each other. They regard each other with suspicion, and they worry that war might be in the offing. They anticipate danger. There is little room for trust among states. Although the level of fear varies across time and space, it can never be reduced to a trivial level.”⁴¹ Instead of trust, fear is the key concept in offensive realism. The basis of this fear is that “in a world where states have the capability to offend against each other, and might have the motive to do so, any state bent on survival must be at least suspicious of other states and reluctant to trust them.”⁴²

³⁹Thomas Hobbes, "Leviathan. Edited by Cb Macpherson 1968. Reprinted 1987," (Harmondsworth: Penguin Books); Gregory S Kavka, "Hobbes's War of All against All," *Ethics* (1983).

⁴⁰David P Gauthier, "The Logic of Leviathan: The Moral and Political Theory of Thomas Hobbes," (1969); Gregory S Kavka, *Hobbesian Moral and Political Theory*(Princeton University Press, 1986).

⁴¹John J Mearsheimer, "The False Promise of International Institutions," *International security* (1994).

⁴²Ibid.

The reason that offensive realists dismiss the concept of trust is that they believe that even if states have different motivations—security seeking or expansion—they would behave similarly in an anarchic system. Because “states seek to survive under anarchy by maximizing their power relative to other states, in order to maintain the means for self-defense,” even security seekers “seek opportunities to weaken potential adversaries and improve their relative power position. They sometimes see aggression as the best way to accumulate more power at the expense of rivals.”⁴³ Kenneth Waltz shares this view: “[I]n an anarchic domain, a state of war exists if all parties lust for power. But so too will a state of war exist if all states seek only to ensure their own safety.”⁴⁴

The underlining premise is that every state pursues “relative gains” rather than “absolute gains” when it comes to security issues. As Waltz puts it, “In an anarchic domain, the source of one’s own comfort is the source of another’s worry.”⁴⁵ This, however, does not seem to always be the case in the U.S.-Chinese nuclear relationship. China has for decades kept a very modest nuclear stockpile, even when the U.S. stockpile grew to more than 30,000 nuclear weapons at the height of the Cold War.⁴⁶ The “relative gains” against the United States, or any other country, do not appear to be a major concern for China’s decision makers. In many cases, both the United States and China showed significant interests in cooperating with each other to achieve common objectives such as the indefinite extension of the Nuclear Nonproliferation Treaty in 1995 and joint efforts to strengthen regional and international nonproliferation regimes. They even managed to

⁴³“Back to the Future: Instability in Europe after the Cold War,” *International security* (1990).

⁴⁴Kenneth N Waltz, “The Origins of War in Neorealist Theory,” *Journal of Interdisciplinary History* (1988).

⁴⁵Ibid.

⁴⁶Stephen I Schwartz, *Atomic Audit: The Costs and Consequences of Us Nuclear Weapons since 1940* (Brookings Institution Press, 2011).

work together and reached an agreement on a comprehensive nuclear test ban. All these examples demonstrate that offensive realism's obsession with relative gains and its categorical rejection of trust in IR have serious problems.

Defensive realism differs from offensive realism in the sense that defensive realists reject the categorical dismissal of trust in IR. Although they share the basic realist assumption that states are rational, unitary actors in an anarchic system, they tend to highlight that states are motivated by the desire for security and are therefore mostly security seekers.⁴⁷ They believe that a certain level of trust can be established and states can form a relatively stable relationship. They can manage to coexist peacefully and to cooperate on common interests.⁴⁸

Moreover, defensive realists believe that the way to build trust is to manage to send accurate signals about one's benign and security-seeking intentions that can be distinguished from aggressive intentions.⁴⁹ Some of their research focuses on the conditions that may make it easier or more difficult to send distinguishable signals. The offense-defense balance literature, for example, argues that in a defense-dominant environment, if defensive weapons and offensive weapons are clearly distinguishable, security-seeking countries can choose to invest in defensive weapons to signal their benign intentions to each other and therefore avoid an arms race.⁵⁰

⁴⁷Andrew Kydd, "Sheep in Sheep's Clothing: Why Security Seekers Do Not Fight Each Other," *Security Studies* 7, no. 1 (1997); Jeffrey W Taliaferro, "Security Seeking under Anarchy: Defensive Realism Revisited," (2006); Charles L Glaser, "Realists as Optimists: Cooperation as Self-Help," *International Security* (1994).

⁴⁸Michael Spirtas, "A House Divided: Tragedy and Evil in Realist Theory," *Security Studies* 5, no. 3 (1996).

⁴⁹Glaser, "Realists as Optimists: Cooperation as Self-Help."

⁵⁰Robert Jervis, "Cooperation under the Security Dilemma," *World politics* 30, no. 02 (1978); Charles L Glaser, "The Security Dilemma Revisited," *ibid.* 50, no. 01 (1997).

Trust is not a central concept for liberalism either. But liberal scholars attach more importance to common interests. Neoliberals believe that the building of interdependence can lead to a web of shared interests that promotes cooperation.⁵¹ Robert Keohane's neoliberal institutionalism highlights the possibility of contingent cooperation even in an anarchic system.⁵² For neoliberal institutionalists, trust is possible but is specific to particular situations and is based on information.⁵³ They recognize that fear drives states' policy-making in anarchy but believe that fear results from lack of information. "Through the provision of information, trust of particular others becomes possible. As shadows of future are lengthened, linkages are created, and reputations put at a premium, the level of trust between egoists increases as their interests come to encapsulate one another. All of these mechanisms focus almost exclusively on creating incentives for trustworthy behavior through adjustments to the strategic environment."⁵⁴

One of the liberal theories that relates to the issue of trust is the theory that argues that it is less likely for democratic countries to fight democratic countries.⁵⁵ There are various explanations about why this might be the case, but the general idea is that democratic countries are more likely to be security seekers. For instance, Jack Snyder points out that centralized political systems are more likely to embrace expansionist interests whereas

⁵¹David Allen Baldwin, *Neorealism and Neoliberalism: The Contemporary Debate*(Columbia University Press, 1993).

⁵²Robert Keohane, "After Hegemony: Cooperation and Discord in the World Political Economy," *Princeton: Princeton University Press* 12(1984).

⁵³Brian C Rathbun, "It Takes All Types: Social Psychology, Trust, and the International Relations Paradigm in Our Minds," *International Theory* 1, no. 03 (2009); Robert M. Axelrod, *The Evolution of Cooperation*(New York: Basic Books, 1984); Kenneth A. Oye, "Explaining Cooperation under Anarchy: Hypotheses and Strategies," *World Politics* 38, no. 01 (1985).

⁵⁴Rathbun, "It Takes All Types: Social Psychology, Trust, and the International Relations Paradigm in Our Minds." P. 350.

⁵⁵James Lee Ray, *Democracy and International Conflict: An Evaluation of the Democratic Peace Proposition*(University of South Carolina Press Columbia, 1995); Bruce Russett, *Grasping the Democratic Peace: Principles for a Post-Cold War World*(Princeton University Press, 1994).

democratic systems undermine the ability of political elites to promote expansionist interests.⁵⁶ Bruce Bueno de Mesquita, James Morrow, and others argue that authoritarian states are more likely to be expansionists because the ruling few are the ones who disproportionately benefit from any military invasion or conquest and therefore have a particular interest in expansionist policies.⁵⁷ Others make the argument that ordinary citizens have a bigger voice in influencing policy-making in democracies. Because ordinary citizens often bear the highest cost and suffering from wars, they are usually less inclined to launch wars with other countries. This makes democracies less likely to be expansionists.⁵⁸

For these reasons, liberal theory suggests that regime types affect interstate trust building and that democracies are more likely to trust each other. This, however, is not very helpful for understanding trust building between a democracy and a nondemocracy, such as between the United States and China. On the one hand, the United States and China have different domestic political systems; on the other hand, there could be significant common interests between the two. As mentioned before, neoliberal institutionalists recognize that common interests are the foundation for building trust and that provision of information will help reduce mistrust.⁵⁹ Thus, what would happen when these contradictory conditions come together? What is the specific impact of regime type on

⁵⁶ Jack Snyder, "Myths of Empire," *Domestic Politics and International Ambition*, Ithaca, NY (1991).

⁵⁷ Bruce Bueno De Mesquita et al., "An Institutional Explanation of the Democratic Peace," *American Political Science Review* (1999).

⁵⁸ John M Owen, "How Liberalism Produces Democratic Peace," *International security* (1994); Bruce Bueno De Mesquita and David Lalman, *War and Reason: Domestic and International Imperatives* (Cambridge Univ Press, 1992).

⁵⁹ Robert O Keohane and Lisa L Martin, "The Promise of Institutional Theory," *International Security* 20, no. 1 (1995).

trust building in a democracy-nondemocracy dyad? These issues need to be further explored.

Neoliberal institutionalism's reliance on transparency and provision of information for reducing uncertainty and building trust has its limitations. Interstate communication and share of information is rarely thorough, complete, and symmetric.⁶⁰ Even if there is sufficient information available, verification of the authenticity of the shared information beforehand is always difficult. Especially for highly sensitive national security issues, neoliberal institutionalists do not explain how states can be convinced to exercise self-restraint and goodwill and commit themselves to building institutions in the first place.

In general, rationalist theories assume that states have clearly defined and predetermined interests. Their analysis "relies on a strategic conception of rationality, in which actors seek the best strategy for realizing predetermined preferences."⁶¹ For many realists, states' interests are predetermined by the structure of the international system. One's relative material capability determines one's position in the system, which then determines one's interests. Knowledge of capabilities is viewed as far more reliable than knowledge of intentions.⁶² From the realist perspective, intentions can and will change; states are better off focusing on power rather than intentions.⁶³ As a result, structural realists pay little

⁶⁰Miao (耿淼) Geng, "Theoretical Research on Inter-State Trust Issue in the Modern States' System: The Concept of Inter-State Trust and Its Compatibility with the Prevailing International Relation Theories (现代国家体系中国家间信任问题的理论初探——国家间信任的概念及其与主流国际关系理论的兼容性)" (Renmin University of China (中国人民大学), 2005).

⁶¹Lynch, "Why Engage? China and the Logic of Communicative Engagement."

⁶²Barry Buzan, Charles A Jones, and Richard Little, *The Logic of Anarchy: Neorealism to Structural Realism*(Columbia University Press, 1993); Kenneth N Waltz, "Structural Realism after the Cold War," *International security* 25, no. 1 (2000).

⁶³Stefano Guzzini, "Structural Power: The Limits of Neorealist Power Analysis," *International Organization* 47, no. 03 (1993).

attention to issues of understanding intentions through interstate communication and signaling.⁶⁴

Neoliberal institutionalists are more concerned with effective communication and conveying reliable information about states' preferences. Their research focuses on how to send credible signals to convey preferences and intentions. The "costly signal" argument, for example, points out that a costly signal is more credible and can help distinguish real intentions from "cheap talks."⁶⁵ Some experts use the "costly signal" theory to understand the dynamics of "hand-tying" and "sunk-cost" signals in international politics and to evaluate whether forward deployment of tactical nuclear weapons by the United States in allied countries would help send "costly signal" about U.S. commitment in extended nuclear deterrence and therefore improve the credibility of U.S. reassurance to its allies.⁶⁶

However, from the trust-building perspective, "costly signal" can only serve to reveal true intentions at a time; it does not speak to how confidence about a state's long-term intentions can be established. More importantly, such theories tend to dismiss the usefulness of long-term bilateral engagement for improving mutual understanding about each other's intentions. From this perspective, communication is a form of "cheap talk,"

⁶⁴Glaser, "Realists as Optimists: Cooperation as Self-Help."; Daryl Grayson Press, *Calculating Credibility: How Leaders Assess Military Threats*(Cornell University Press, 2005).

⁶⁵Andrew Kydd, "Which Side Are You On? Bias, Credibility, and Mediation," *American Journal of Political Science* 47, no. 4 (2003); James D Fearon, "Signaling Foreign Policy Interests Tying Hands Versus Sinking Costs," *Journal of Conflict Resolution* 41, no. 1 (1997); Daniel T Blumstein et al., "The Peacock's Tale: Lessons from Evolution for Effective Signaling in International Politics," *Clodynamics: The Journal of Theoretical and Mathematical History* 3, no. 1 (2012).

⁶⁶See, for example, Matthew Fuhrmann and Todd S Sechser, "Signaling Alliance Commitments: Hand - Tying and Sunk Costs in Extended Nuclear Deterrence," *American Journal of Political Science* (2014); Philipp C Bleek and Eric Lorber, "Friends Don' t Let Friends Proliferate: Credibility, Security Assurances, and Allied Nuclear Proliferation,"(Paper Prepared for the Project On Strategic Stability Evaluation (POSSE) and the International Studies Association Annual Meeting, 2013).

which is not costly and thus cannot increase credibility.⁶⁷ In practice, however, such “cheap talk”—when it takes place on a sustained, long-term basis—can indeed help reveal true intentions and promote mutual understanding. This research’s in-depth study on U.S.-Chinese engagement on a range of nuclear arms control and nonproliferation issues speaks to that effect. In other words, “cheap talk” can be as useful a tool for revealing true intentions as “costly signals.”

In general, rationalists perceive a state’s interests and preferences as predetermined and fixed. For traditional realists, as mentioned above, a state’s interests are derived from the structure of the international system and its relative position within this system.⁶⁸ For liberal institutionalists, a state also has clearly defined and fixed interests. What liberal institutionalists focus on is how to reduce transaction costs and help states achieve their predetermined interests through the development of institutions.⁶⁹ This is why rationalist theories have serious problems for understanding how trust gets built. In the case of U.S.-Chinese nuclear engagement, there is clear evidence that Chinese understanding of their national interests changed, partly as a result of bilateral engagement. During the late 1980s and early 1990s, China’s relative position in the international system did not change significantly, but China’s attitudes toward a range of important nuclear arms control and nonproliferation issues changed dramatically. By tracing the evolution of China’s domestic discussion on these issues, this research finds that such change of attitudes was primarily due to a perception change on fundamental assumptions about

⁶⁷Charles L Glaser, "Political Consequences of Military Strategy: Expanding and Refining the Spiral and Deterrence Models," *World politics* 44, no. 04 (1992).

⁶⁸Guzzini, "Structural Power: The Limits of Neorealist Power Analysis."

⁶⁹Robert O Keohane, *International Institutions: Two Approaches*(Springer, 1989); Andrew Moravcsik, "Taking Preferences Seriously: A Liberal Theory of International Politics," *International organization* 51, no. 04 (1997).

what are China's interests, and this perception change was very much attributable to the influence of U.S.-Chinese nuclear engagement. In other words, a state's interests and preferences are not predetermined or fixed, even when the structure of the international system remains the same. Rationalist theories cannot account for the change of a state's perception of its interests. Since rationalists believe that common interests are the foundation for trust, their view about predetermined national interests undermines their ability to explain trust building in IR.

Contrary to the rationalist argument, this research points out that common interests do not automatically become incentives for cooperation because states do not always automatically recognize the existence of common interests. In many cases, as this research will show, a state's perception of its interests and of other states' interests changes, even when external material variables remain the same. It is not a straightforward process for two states to come to agree on whether they share common interests or what their common interests are. In this regard, this research recognizes that trust-building is less about any static perception of common interests and more about the process by which two states come to recognize that they share more common interests than they previously thought. This incremental process of perceived convergence toward common interests is an important part of trust building that has not been fully addressed by the existing literature.

In addition, rationalist theories tend to ignore the influence of morality or ethics. For realist scholars, morality or norms do not play an important role. Morgenthau, for example, warns against a moralistic foreign policy, and believes that there are no

universal moral principles that apply to state actions.⁷⁰ Moral considerations must be subordinate to “reason of state.” “Other criteria, sadder, more limited, more practical must be allowed to prevail.”⁷¹ Realism’s rejection of moral considerations does not seem to fit with the empirical record, even in highly sensitive national security issue areas. In the case of China’s nuclear policy-making, China’s persistent embrace of the unconditional No First Use policy is an example of moral consideration. Mao Zedong and Deng Xiaoping pointed to moral considerations as the primary reason for their adoption of the No First Use policy,⁷² despite the fact that No First Use actually reduced China’s capability to deter large-scale conventional attacks and was not the best choice for China from a pure security perspective.⁷³

Morality does not receive priority attention in liberal theories either. Liberal institutionalists focus on how to derive an accurate understanding about a state’s intention through communication and signaling. Based on understanding of intentions, they distinguish security seekers (status quo countries) from aggressors (expansionist countries).⁷⁴ Some point out that democratic states are more likely to be security seekers because they usually find wars to be costly and of little intrinsic benefit, whereas authoritarian states are more likely to be aggressive and volatile because of fewer

⁷⁰Hans Morgenthau, "Politics among Nations: The Struggle for Peace and Power," (New York: Knopf, 1973).

⁷¹George Frost Kennan, *Realities of American Foreign Policy*(Norton, 1966).

⁷²Jin (邹谨) Zou, "Deng Xiaoping's Nuclear Strategy Thinking (邓小平的核战略思想)," *Journal of the Party School of CPC Yunan Province Committee (中共云南省委党校学报)*, no. 04 (2006); Lijuan (蔡丽娟) Cai, "An Analysis of Deng Xiaoping's Nuclear Strategic Thinking (论邓小平的核战略思想)," *Theory Guide (理论导刊)*, no. 04 (2006); Li (王莉) Wang, "Factors Behind the Evolution of China' Nuclear Strategy During the Mao Zedong and Deng Xiaoping Era (毛泽东与邓小平时代的中国核战略演进动因分析)" (Foreign Affairs University, 2011).

⁷³Brad Roberts, Robert A Manning, and Ronald N Montaperto, "China: The Forgotten Nuclear Power," *Foreign Affairs* (2000).

⁷⁴Robert Jervis, "Realism, Neoliberalism, and Cooperation: Understanding the Debate," *International Security* 24, no. 1 (1999).

citizenry constraints.⁷⁵ It is also argued that democratic states are more likely to be seen as security seekers because of their transparency.⁷⁶ In any case, liberalists argue that some countries are more likely to be trusted as security seekers for reasons of their domestic political systems rather than moral considerations. Trust is not linked to morality in these theories.

Morality plays a much more prominent role in constructivism. The moral principles that a state embraces are regarded as part of a state's identity,⁷⁷ and states' identity is at the core of constructivists' understanding of trust. For constructivists, international politics is socially constructed and collective identity is the precondition for trust.⁷⁸ They argue that perceptions about each other's identity determine whether they see each other as friends or enemies.⁷⁹ If two states believe that they have a shared identity, they are more likely to see each other as friends and they are more likely to trust each other. This collective identity helps construct a friendly relationship and makes self-help behavior less likely to take place, which is conducive to the formation of a "security community."⁸⁰ In contrast, if two states believe that they do not share a collective identity, they are more likely to

⁷⁵Kydd, *Trust and Mistrust in International Relations*.

⁷⁶De Mesquita and Lalman, *War and Reason: Domestic and International Imperatives*.

⁷⁷Amy Gutmann, *Identity in Democracy*(Princeton University Press, 2009); Christian Reus-Smit, *The Moral Purpose of the State: Culture, Social Identity, and Institutional Rationality in International Relations*(Princeton University Press, 1999).

⁷⁸Alexander Wendt, *Social Theory of International Politics*(Cambridge University Press, 1999); Rathbun, "It Takes All Types: Social Psychology, Trust, and the International Relations Paradigm in Our Minds."

⁷⁹Wendt, *Social Theory of International Politics*; Yaqing (秦亚青) Qin, "Anarchy in International System: A Review of Wendt's Social Theory of International Politics (国际体系的无政府性——读温特<国际政治的社会理论>)," *International Politics (国际政治)*, no. 10 (2001).

⁸⁰Geng, "Theoretical Research on Inter-State Trust Issue in the Modern States' System: The Concept of Inter-State Trust and Its Compatibility with the Prevailing International Relation Theories (现代国家体系中国家间信任问题的理论初探——国家间信任的概念及其与主流国际关系理论的兼容性)."

see each other as enemies and much less likely to trust each other.⁸¹ A number of studies have shown that threat perception is not only based on material capability but is also affected by ideational factors. Different political ideologies make states feel threatened and compel them to react to the perceived ideational threats.⁸² Some scholars have used empirical evidence to show that perception of each other's identity does influence one state's threat perception of the other. Democracies, for examples, are less likely to construct other democracies as threats but are more likely to construct external nondemocracies as threats.⁸³

One problem is that mainstream constructivist theories cannot account for significant cooperation between states that do not share common identities.⁸⁴ They argue that shared identity allows for the initiation of the cooperative process. This contradicts empirical evidence in the U.S.-Chinese nuclear relationship. As this research will show, there was little common identity between the United States and China, but they still managed to cooperate on a range of important nuclear arms control and nonproliferation issues including the signing of the Comprehensive Test Ban Treaty and the indefinite extension of the Nuclear Nonproliferation Treaty, among others.

However, constructivism does not reject the possibility of building trust between states.

Wendt, for example, points out that fear and conflict are not inevitable. States are not

⁸¹Wendt, *Social Theory of International Politics*; John Gerard Ruggie, "What Makes the World Hang Together? Neo-Utilitarianism and the Social Constructivist Challenge," *International organization* 52, no. 04 (1998); Geng, "Theoretical Research on Inter-State Trust Issue in the Modern States' System: The Concept of Inter-State Trust and Its Compatibility with the Prevailing International Relation Theories (现代国家体系中国家间信任问题的理论初探——国家间信任的概念及其与主流国际关系理论的兼容性)."

⁸²Lawrence Rubin, *Islam in the Balance: Ideational Threats in Arab Politics*(Stanford University Press, 2014).

⁸³Jarrold Hayes, *Constructing National Security: Us Relations with China and India*(Cambridge University Press, 2013).

⁸⁴Rathbun, *Trust in International Cooperation: International Security Institutions, Domestic Politics and American Multilateralism*.

doomed to live forever in a highly competitive, self-help Hobbesian anarchy; they can actually change the dynamics of their interaction and live in a more cooperative environment if they choose.⁸⁵ For constructivists, the key to start this transformative process is to build trust through interaction: "Trust-building might begin through a rationalist process of signaling and conveying information, but the process is more transformative, allowing for a redefinition of self and other from adversary to partner to friend."⁸⁶

The limitation of this argument is that it has not been proven by empirical evidence. Constructivists believe that engagement is not only about communication: engagement can help understand preferences, but more importantly it can help change preferences.⁸⁷ Research on engagement and foreign policy change indicates that engagement may be able to bring about four graduated levels of a country's foreign policy change: adjustment change, program change, problem/goal change, and international orientation change.⁸⁸ Among them, the international orientation change is the most extreme form of foreign policy change that involves "the redirection of the actor's entire orientation toward world affairs" and "a basic shift in the actor's international role and activities."⁸⁹ The problem is there has been little empirical research that actually shows that such a fundamental change of self-identification and one's "international role" indeed take place as a result of communication and engagement. Does engagement help states embark on a more

⁸⁵Alexander Wendt, "Anarchy Is What States Make of It: The Social Construction of Power Politics," *International organization* 46, no. 02 (1992).

⁸⁶Rathbun, "It Takes All Types: Social Psychology, Trust, and the International Relations Paradigm in Our Minds."

⁸⁷Lynch, "Why Engage? China and the Logic of Communicative Engagement."

⁸⁸Charles F Hermann, "Changing Course: When Governments Choose to Redirect Foreign Policy," *International Studies Quarterly* (1990).

⁸⁹Ibid.

cooperative path by bringing about identity change? This is the question that constructivist theories have not fully addressed and that this research seeks to shed light on.

A Better Framework for Understanding Trust

The rationalist understanding of trust, especially the trust-as-encapsulated-interests school of thought rightly emphasizes encapsulated interests as the material foundation of a trusting relationship. From their perspective, trust means full predictability resulting from removing as much uncertainty/risk as possible from calculations of benefits and costs. However, defining trust in such a fully deterministic setting runs the risk of begging the question of the relevance of trust in IR: when there is no threat of betrayal, there is no “problem of trust” in the first place.

This is where the trust-as-risk-taking school of thought comes into play. The trust-as-risk-taking school, however, is also problematic. It equates trust with willingness to take risks but fails to distinguish different types of risk taking in IR. There is one type of risk taking in which the trustor expects the trustee to cooperate because the trustor believes that the trustee will do “what is right” even if this means sacrificing some of the trustee’s own benefits.⁹⁰ There is also another type of risk taking in which one simply makes a series of

⁹⁰Charles W Kegley and Gregory A Raymond, *When Trust Breaks Down: Alliance Norms and World Politics*(University of South Carolina Press, 1990); Bernhardt Lieberman, "I-Trust: A Notion of Trust in

calculations that include the chances of the other choosing to cooperate against the chances of the other choosing to cheat, as well as the benefits and costs associated with each possible choice that the other might make. Based on such calculations or assessments, one then makes a decision whether to take the risk or not. The second type of risk taking is closer to risk taking in gambling than to risk taking in a trusting relationship as people normally understand it.

Therefore, trust sometimes implies a willingness to take risks related to the behavior of others based on the belief that potential trustees will “do what is right.” This distinguishes trusting from nontrusting relationships. Thus, researchers cannot simply look at decision-making records to find and measure trust. They have to look into the domestic policy-making process to detect a trusting relationship by connecting the decision-making record to the policy choices and deliberation process.

In general, the existing literature agrees that trust is closely related to predictability. What the experts disagree about is where this predictability comes from. The trust-as-encapsulated-interests school believes that predictability derives from the recognition of common interests. In comparison, the trust-as-risk-taking school and the trust-as-bond school do not reject encapsulated interests as one source for generating predictability, but their arguments imply that predictability can also be generated by something other than material calculations (i.e., faith in shared moral values and principles). Some experts describe such trust as “generalized trust,” as opposed to “situational” trust or trust that is

Three-Person Games and International Affairs," *Journal of Conflict Resolution* (1964); Bernard Barber, *The Logic and Limits of Trust*, vol. 96 (Rutgers University Press New Brunswick, NJ, 1983).

“tailored to individual circumstances.”⁹¹ When people say Actor A is more trustworthy than Actor B, their trust toward Actor A is not completely contingent upon specific situations but is a reflection of their confidence that they can better predict the behavior of Actor A than that of Actor B because they have faith in their shared moral values with A. In this research, I use the term “moralistic trust” to refer to the second type of trust, which is based on predictability derived from shared moral values and principles, and I use the term “strategic trust” to name the first type of trust, which is based on predictability derived from encapsulated interests.

The problem with the traditional approach for measuring trust is already recognized by some scholars.⁹² For instance, one approach assumes that presence of trust is necessary for cooperation to take place.⁹³ Under this assumption, there is no need to develop a separate method for measuring trust. Since the existence of cooperation indicates the presence of trust, cases of cooperation are treated as cases of trust. The problem is that cooperation may be motivated by a range of factors that have nothing to do with trust. States could be coerced into cooperation, for instance. This research seeks to avoid using cooperation to measure trust. Instead, it uses the following indicators to measure the existence of different types of trust (as shown in Table 1).

⁹¹Rathbun, *Trust in International Cooperation: International Security Institutions, Domestic Politics and American Multilateralism*.

⁹²Hoffman, "In States We Trust: The Evolution and Decline of Trusting Relationships in the United States, 1776--1860, and the European Community, 1950--1986."

⁹³Deborah Welch Larson, *Anatomy of Mistrust: Us-Soviet Relations During the Cold War*(Cornell University Press, 2000); Morton Deutsch, "Trust and Suspicion," *Journal of conflict resolution* 2, no. 4 (1958); Coleman and Coleman, *Foundations of Social Theory*.

Table 1 Operationalization of Trust

Type of Trust	Features	Indicators
No Trust	<ul style="list-style-type: none"> • No recognition of common interests • No recognition of shared moral principles 	<ul style="list-style-type: none"> • No expression of common interests • Expression of conflicting moral principles
Strategic Trust	<ul style="list-style-type: none"> • Recognition of common interests; • No recognition of shared moral principles 	<ul style="list-style-type: none"> • Expression of common interests • No emphasis on importance of moral principles in policy-making <ul style="list-style-type: none"> ◦ Expression of principles of self-help, power politics, and coercion • Expression of conflicting moral principles with the partner • Risk aversion <ul style="list-style-type: none"> ◦ High demand for verification ◦ Use enforcement to address uncertainty ◦ Hedging strategy
Moralistic Trust	<ul style="list-style-type: none"> • Recognition of shared moral principles 	<ul style="list-style-type: none"> • Emphasis on importance of moral principles in policy-making • Expression of shared moral principles • Internalization of shared norms • Expression of strong group identity with the partner • Cooperative risk-acceptance <ul style="list-style-type: none"> ◦ Low demand for verification ◦ Allow for delayed “compensatory” reciprocation • Expression of security dilemma sensibility

In this research, “no trust” refers to a relationship where there are no recognized common interests or shared moral principles. In such a zero-sum game, actors use deceptions to deliberately increase unpredictability. One example of “no trust” would be the U.S.-China nuclear relationship before China set up its small rudimentary nuclear force. Before that, China had no experience of operating a nuclear force and had no appreciation of the potential risks and consequences of unintentional nuclear conflict and inadvertent escalation. China therefore adopted deceptive policies to create the greatest amount of confusion possible in the mind of American policy makers out of the belief that the more the Americans were confused/deceived, the better Chinese interests were protected.

“Strategic trust” refers to the relationship in which the recognition of common interests motivates actors to cooperate but there is no recognition of shared moral principles. In this relationship, Actor A sees Actor B as either having low regard for moral principles in policy-making or having conflicting moral principles with Actor A. In the first case, Actor A may believe Actor B has a worldview of hard-nosed *realpolitik* (i.e., embracing *realpolitik* doctrines of self-help and power politics and rejecting moral principles as guidance for policy). In the second case, Actor A may perceive Actor B as a follower of some moral principles, but their moral principles are different or even conflicting. In either case, without any ethical bond or moral connections, Actor A would choose to cooperate with B completely out of “strategic” calculations. However, the existence of common interests does not always guarantee the complete avoidance of cheating taking place, especially if Actor B could get more benefit from exploiting A’s preference for

cooperation. So if A faces any significant uncertainty/risk, it will not cooperate, despite the existence of common interests. In other words, A is risk averse.

Because Actor A is not open to taking any uncertainty/risk in granting Actor B discretion over A's own interests, it either demands perfect information about B's intention, capability, etc., or needs institutional mechanisms to help remove any uncertainty that B might cheat during their interaction. One example of "strategic trust" can be found in U.S.-China negotiation over the Comprehensive Test Ban Treaty (CTBT) in which both countries had shared interests in prohibiting further nuclear testing. But they only managed to cooperate on this matter after spending years setting up a comprehensive verification system, as well as a set of complicated rules to prevent inspection abuses and gaining strong confidence about the reliability of the systems and institutions. If the verification technology at that time did not manage to satisfy their demand for almost zero uncertainty, the CTBT negotiation would have probably failed.

It is necessary to emphasize that the "recognition" of common interests is key for "strategic trust." In other words, both actors need to "recognize" that they share common interests for any "strategic trust" to exist. Many rationalist studies talk about common interests as if they were an objective reality that is apparent to everyone.⁹⁴ This research will show that this is not necessarily the case. It took the United States and China much time and effort to recognize that they do share common interests on important nuclear issues, and the scope and scale of these perceived common interests has increased over time. This, by itself, constitutes an important part of U.S.-Chinese trust building.

⁹⁴Keohane, *International Institutions: Two Approaches*; Moravcsik, "Taking Preferences Seriously: A Liberal Theory of International Politics."

“Moralistic trust” is the existence of a sense of moral obligation that develops out of identification with the trustor and its moral principles. As opposed to strategic trust—the belief that a potential trustee will do what is beneficial for itself—moralistic trust is based on the belief that a potential trustee will “do what is right.” The trustee’s commitment to the moral values of the trustor or the values of the group in which they are both members inhibits the trustee from taking advantage of gains at the expense of the trustor.

For moralistic trust to work, the trustee needs to show that it respects moral principles as an important guide in its policy deliberation and that it shares the same set of moral principles with the trustor. It needs to internalize those international norms that the trustor embraces and share a strong sense of group identity and in-group favoritism with the trustor. The most important indicator for moralistic trust—which distinguishes it from strategic trust—is the trustor’s cooperative, risk-accepting behavior toward the trustee. Risk-averse *realpolitik* thinking is thus transcended and replaced by some sort of *idealpolitik* thinking that can only take place under a strong sense of shared moral principles. When it comes to nuclear arms control and nonproliferation, it usually means less demand on verification regimes and higher tolerance for delayed reciprocation from the partner in bilateral interactions.⁹⁵

Another indicator for “moralistic trust” is the embrace of security dilemma sensibility. Security dilemma sensibility refers to a state’s awareness about the existence of a security dilemma and about the possibility that one’s own defensive action can create fear in the mind of the other and can drive the other to take countermeasures. Ken Booth and

⁹⁵Roderick M. Kramer, Marilyn B. Brewer, and Benjamin A. Hanna, *Collective Trust and Collective Action: The Decision to Trust as a Social Decision. Trust in Organizations: Frontiers of Theory and Research*. Sage Publications, Inc.(Thousand Oaks, CA: SAGE Publications, Inc., 1996).

Nicholas Wheeler define security dilemma as “an actor’s intention and capacity to perceive the motives behind, and to show responsiveness towards, the potential complexity of the military intentions of others. In particular, it refers to the ability to understand the role that fear might play in their attitudes and behaviour, including, crucially, the role that one’s own actions may play in provoking that fear.”⁹⁶ The *realpolitik* assumption is that states have malignant intentions or must be treated as if they do.⁹⁷ But if a state is sensible about the existence and impact of a security dilemma, it understands that the other’s seemingly threatening behavior might not necessarily be a sign of aggression and it could very well be a response to one’s own seemingly defensive action. As a result, security dilemma sensibility helps a state avoid overexaggeration of threat and avoid worst-case analysis of the other’s intentions. This helps lay the ground for states to build “moralistic trust.”

Bottom-Up Engagement and Trust-building

Although trust is an important concept in IR theory, there has not been much work devoted to explaining how interstate trust emerges in the first place and how it develops. Much of the conceptual framework on trust used in IR literature is adopted from social psychology studies.⁹⁸ As a result, studies of trust in IR usually assume that interpersonal notions of trust can be used, without modification, to understand interstate relations. This

⁹⁶Booth and Wheeler, *The Security Dilemma: Fear, Cooperation, and Trust in World Politics*; Nicholas J Wheeler, "To Put Oneself into the Other Fellow's Place": John Herz, the Security Dilemma and the Nuclear Age," *International Relations* 22, no. 4 (2008); Ken Booth and Nicholas Wheeler, "Rethinking the Security Dilemma," *Security Studies*.

⁹⁷Rathbun, "It Takes All Types: Social Psychology, Trust, and the International Relations Paradigm in Our Minds."

⁹⁸Brewer, "The Social Psychology of Intergroup Relations: Can Research Inform Practice?."; Coleman and Coleman, *Foundations of Social Theory*; Hardin, *Trust and Trustworthiness*; Lewis and Weigert, "Trust as a Social Reality."; Tyler, "Why Do People Rely on Others? Social Identity and Social Aspects of Trust."

assumption, however, is problematic. It obscures important differences between interpersonal and interstate behavior, and more importantly, it avoids the critical question of the relationship between trust at the interpersonal level, or trust between groups of individuals, and trust at interstate level (between national states).

In the existing literature, there are generally two approaches to applying interpersonal trust to the realm of interstate relations. The unitary rational actor approach reduces a national state into a fictional decision maker and treats interstate trust as trust between the fictional decision makers.⁹⁹ In contrast, the societal approach implies that states trust each other when their citizens and citizen-associations trust each other.¹⁰⁰

Both approaches present serious problems for understanding interstate trust. In the reality of national decision making, there are a variety of different domestic players who participate or have influence in the process: citizens or citizen groups, officials at different bureaucratic levels, and the national leadership, among others. Reducing the complex decision-making body into one fictional decision maker makes it impossible to understand how trust really gets built during interstate interaction. The societal approach also fails to describe how states act upon the trust that citizens or citizen groups feel for each other. It also does not take into account the very likely scenario that different citizen groups have different perceptions when it comes to trusting their counterparts in another state. In this case, the regime type or the type of domestic political institution of a state is going to affect the extent to which it can mediate conflicting domestic perceptions. This,

⁹⁹Zeev Maoz and Dan S Felsenthal, "Self-Binding Commitments, the Inducement of Trust, Social Choice, and the Theory of International Cooperation," *International Studies Quarterly* (1987); Andrew Kydd, "Trust, Reassurance, and Cooperation," *International Organization* 54, no. 2 (2000).

¹⁰⁰Francis Fukuyama, *Trust: The Social Virtues and the Creation of Prosperity*(Free Press New York, 1995).

however, has not been elaborated by the societal approach, although there is limited discussion about the relationship between regime type, audience cost, and foreign policy signaling.¹⁰¹

For individuals or individual groups to influence the overall thinking of a state, they need to overcome resistance in political and administrative structures and processes.

Bureaucratic inertia and standard operating procedures pose significant obstacles.¹⁰² It is usually assumed that in authoritarian countries individuals or individual groups encounter much greater problems in influencing policy-making. But this research will show that this is not necessarily the case, especially in the nuclear area. In the Chinese case, there were actually plenty of bottom-up communication channels and ways for operational-level players to influence state thinking and policy-making. In general, the existing literature on trust has not fully explained the connection between individuals or individual groups and state decision making and has not shown how the microprocesses take place.

For most scholars, the individuals of interest are the members of the “foreign policy executive...[d]efined as the high-ranking bureaucrats and elected executive officials charged with the overall conduct of defense and foreign affairs.”¹⁰³ When it comes to interstate trust-building, Chinese policy makers and scholars also point to the important role played by high-level decision makers and argue that trust can only be built between top decision makers first before it is possible to talk about trust between policy

¹⁰¹Jessica L Weeks, "Autocratic Audience Costs: Regime Type and Signaling Resolve," *International Organization* (2008); Michael Tomz, "Domestic Audience Costs in International Relations: An Experimental Approach," *ibid.* 61, no. 4 (2007).

¹⁰²Hermann, "Changing Course: When Governments Choose to Redirect Foreign Policy."

¹⁰³Hoffman, "In States We Trust: The Evolution and Decline of Trusting Relationships in the United States, 1776--1860, and the European Community, 1950--1986."; G John Ikenberry, David A Lake, and Michael Mastanduno, *The State and American Foreign Economic Policy*(Cornell University Press, 1988).

practitioners at operational levels. They emphasize the importance of political commitment at the very top level for starting the trust-building process.¹⁰⁴ This is usually called the “top-down” approach of building trust.

In contrast, many Western policy makers and analysts have more faith in the so-called “bottom-up” approach of building trust.¹⁰⁵ The argument is that trust can be built from engagement and cooperation at operational levels and then spreads upward to facilitate the growth of trust at top decision-maker levels. The epistemic community theory seems to lend support to this argument, although this theory focuses on explaining interstate cooperation rather than interstate trust.

The concept of epistemic community is used to describe a “network of professionals with recognized expertise and competence in a particular domain and an authoritative claim to policy-relevant knowledge within that domain or issue-area.”¹⁰⁶ Scholars who study international cooperation are interested in epistemic communities because they believe that epistemic communities can use their recognized expertise to influence policy makers

¹⁰⁴Hui Xu, "Why Is It Difficult to Build U.S.-China Military Mutual Trust? (中美军事互信为何难以建立?)," *Foreign Affairs Review* (外交评论) no. 2 (2010); Dawei Xiao, "Chinese Traditional Strategic Culture and the Cross-Straits Military Security Mutual Trust Mechanism Construction (中国传统战略文化与两岸军事安全互信机制的构建之道)," *Journal of Binzhou University* (滨州学院学报) 28, no. 1 (2012); Lin Sun, "Repeated Games and Mechanism Construction: A Research on Cross-Strait Confidence-Building of Military Security (重复博弈与机制构建: 两岸军事安全互信探析)," *Taiwan Research Journal* (台湾研究集刊), no. 2 (2012); Dawei Xiao, "Choosing the Right Research Approach to Study the Construction of Cross-Strait Military Security Mutual Trust-Building Mechanism (两岸军事安全互信机制构建问题的研究视角选择)," *Taiwan Research and Cross-Strait Relations* (台湾研究-两岸关系), no. 1 (2012); Rusong Wu, *A New Reading of the Art of the War* (孙子兵法新说), 1 ed.(Beijing: People's Liberation Army Press (解放军出版社), 2008).

¹⁰⁵Wheeler, "The Challenges to Trust-Building in Nuclear Worlds Project Practitioners Meeting Report."

¹⁰⁶Peter M. Haas, "Introduction: Epistemic Communities and International Policy Coordination," *International Organization* 46, no. 01 (1992).

and promote those policies that lead to international cooperation.¹⁰⁷ They argue that “international issues are increasingly characterized by their technical aspects, complexity, uncertainty, and interdependence” and “once the expectations and values injected by epistemic communities into the policy process are internationally shared, they help coordinate or structure international relations.”¹⁰⁸ Scholars such as Emanuel Adler claim that epistemic communities “played a key role in creating the international shared understanding and practice of nuclear arms control, which gave meaning to and helped coordinate expectations of superpower cooperation during the Cold War.”¹⁰⁹ Although epistemic community theory looks at the issue of interstate cooperation rather than at interstate trust, it does provide a useful perspective for studying the connection between individuals or individual groups and state decision making.

When it comes to China’s nuclear decision making, the main domestic players include academics, relevant government agencies, and the political leadership. The academics refer to both independent scholars in universities and researchers and analysts in government-sponsored research institutes and think tanks. The three relevant government agencies include: the defense industry (the nuclear weapons labs), the military (the Second Artillery Corps), and the Ministry of Foreign Affairs. Among the main players, academics and technocrats in the government agencies work at the operational level and

¹⁰⁷James K Sebenius, "Challenging Conventional Explanations of International Cooperation: Negotiation Analysis and the Case of Epistemic Communities," *ibid.*, no. 1; Emanuel Adler, "The Emergence of Cooperation: National Epistemic Communities and the International Evolution of the Idea of Nuclear Arms Control," *International organization* 46, no. 01 (1992); Peter M Haas, "Epistemic Communities and the Dynamics of International Environmental Cooperation," *Regime Theory and International Relations*, Oxford (1993); Clair Gough and Simon Shackley, "The Respectable Politics of Climate Change: The Epistemic Communities and Ngos," *International Affairs* 77, no. 2 (2001).

¹⁰⁸Emanuel Adler and Peter M Haas, "Conclusion: Epistemic Communities, World Order, and the Creation of a Reflective Research Program," *International organization* 46, no. 1 (1992).

¹⁰⁹Emanuel Adler, "The Emergence of Cooperation: National Epistemic Communities and the International Evolution of the Idea of Nuclear Arms Control," *ibid.*, no. 01.

comprise the so-called “nuclear community”; they are the ones who follow the development of events on the ground and are mostly exposed to bilateral engagement with their U.S. counterparts. In comparison, high-level officials in the three government agencies and the political leadership at the national level are generally considered top-level players in the system.

Chinese and U.S. policy makers and analysts have had a long debate about what is the most effective approach to conduct mutual engagement for the purpose of building trust. The Chinese top-down approach focuses on interaction between the two countries’ top decision makers, whereas the American bottom-up approach emphasizes the importance of engagement between the technocrats and academics at operational levels. This disagreement has been an obstacle for the two countries to cooperate on important security issues including nuclear issues.

The disagreement essentially boils down to the question of how interstate socialization takes place and what its impact is on security policy-making. The bottom-up approach believes that ideational change usually first takes place at operational levels—as a result of learning, persuasion, and other socialization mechanisms—and then spreads upward to change perceptions at top levels. The top-down approach, by contrast, assumes that ideational change is primarily a top-down process whereby top decision makers initiate a change, which is then followed and implemented by lower levels. Existing literature on interstate socialization does not quite address the issue of at what level the process takes place and what the direction of the causal mechanism is.¹¹⁰ The exact causal mechanism

¹¹⁰Injoo Sohn, "Learning to Co-Operate: China's Multilateral Approach to Asian Financial Co-Operation," *The China Quarterly* 194(2008); Chen Dingding, "China's Participation in the International Human Rights

may be dependent on domestic political structures, as it is usually assumed that top-down change is more likely to take place in authoritarian states, whereas bottom-up change is more often seen in democratic states.¹¹¹ This is why it is important to focus on a specific case (the U.S.-China interaction in this research) and use empirical research to examine the validity of different claims.

Top-down engagement and bottom-up engagement certainly do not exclude or contradict each other. In practice, the United States and China have been conducting both top-level and operational-level engagement. Ideally, it would be helpful to examine the impact of both approaches on trust building. But it is extremely difficult to conduct empirical research on top-down engagement due to the enormous secrecy surrounding top-level communications. Nicholas Wheeler's research on India-Pakistan nuclear trust building, for example, is a rare attempt at examining top-level engagement and the research results demonstrate the limit of such efforts.¹¹² Wheeler's research shows that it is difficult to establish trust through the so-called "leaps of trust" type of top-leadership interaction because such a once-through effort is highly risky and can be easily interrupted by numerous variables beyond the control of the top leadership. Once the first attempt of radically improving the bilateral relationship fails, it becomes very difficult for the policy initiator to gather enough political resources again for another try. In his study, because of the scarcity of available authoritative sources, the research has to focus on one single event—the Indian Prime Minister Atal Behari Vajpayee's meeting with the Pakistani

Regime: A State Identity Perspective," *The Chinese Journal of International Politics* 2, no. 3 (2009); Lynch, "Why Engage? China and the Logic of Communicative Engagement."

¹¹¹Charles Tilly, "Survey Article: Power—Top Down and Bottom Up," *Journal of Political Philosophy* 7, no. 3 (1999).

¹¹²Nicholas J Wheeler, "'I Had Gone to Lahore with a Message of Goodwill but in Return We Got Kargil' 1: The Promise and Perils of 'Leaps of Trust' in India-Pakistan Relations," *India Review* 9, no. 3 (2010).

leader Nawaz Sharif at Lahore in 1999. In the U.S.-Chinese case, the two countries only started to conduct high-level official dialogues that touched upon nuclear issues in the mid-2000s, and most of the official discussions were in fact devoted to economic and nonnuclear-related strategic security issues. Nuclear arms control and nonproliferation have not become a major part of official U.S.-Chinese high-level dialogues. In contrast, bilateral engagement between the United States and China at the operational level has been taking place regularly for more than three decades, and its process and content are much more open and transparent, which provides the opportunity to study the impact of bottom-up engagement on trust-building in the U.S.-China nuclear relationship.

In this bilateral nuclear relationship, it is necessary to distinguish China's trust toward the United States from U.S. trust toward China. This research focuses on the former and seeks to understand whether and how operational-level engagement between the United States and China increases China's trust toward the United States at the top level. It will certainly be helpful to also explore whether a similar impact is observable regarding U.S. trust toward China. However, in the U.S.-Chinese nuclear relationship, China is the one that is traditionally less transparent, less proactive, and less appreciative of cooperative nuclear arms control and nonproliferation efforts. It would be more interesting to understand the impact of operational-level engagement on Chinese perception and policy-making. My follow-up research project in the future will seek to address the other question regarding the impact of bilateral engagement on U.S. trust toward China.

Causal Mechanisms

Because of the distinction between the two types of trust, this research seeks to understand the impact of operational-level engagement on each of the two types of trust, respectively. There are, therefore, two hypotheses to be tested.

Hypothesis 1: Operational-level engagement between the United States and China on nuclear issues increases China's strategic trust in the United States.

Hypothesis 2: Operational-level engagement between the United States and China on nuclear issues increases China's moralistic trust in the United States.

For Hypothesis 1 to be accepted, we should be able to observe at least three dynamics at work. Firstly, operational-level engagement should help create and develop the epistemic community in China (China's nuclear community), including the incorporation of more people from more agencies into this community, helping establish a common vocabulary and common background knowledge within the community and helping reach consensus on important policy issues among the community members. Secondly, as a result of operational-level engagement, the Chinese nuclear community should be able to find new areas of common interests with their American counterparts, reversing its original view that China has few common interests with the United States or has opposite/conflicting interests with the United States. And thirdly, the Chinese nuclear community's recognition of increased common interests and its new motivation to pursue such common interests with the United States should be able to affect policy thinking at the top government level and therefore increase China's strategic trust toward the United States at the top level.

These causal dynamics represent three specific hypotheses that need to be tested.

Hypothesis 1A: Operational-level engagement promotes the growth and expansion of a Chinese nuclear community that shares a common vocabulary with the U.S. nuclear community and understands important concepts that are used by the U.S. nuclear community.

For this hypothesis to be accepted (to reject the null hypothesis of no relationship between operational-level engagement and expansion of the Chinese nuclear community), we need to be able to identify a causal connection between operational-level engagement and the occurrence of the following events:

Operational-level engagement creates institutional interests that attract more people from an increasing number of institutions/agencies (academics, the military, the defense industry, the foreign ministry, and other relevant government agencies) to study and discuss nuclear-related issues.

This growing group of people develops sophisticated understanding about U.S. nuclear policy and policy-making over time and begins to understand and share a common vocabulary on important technical and policy matters with the U.S. nuclear community.

This growing group of people is able to reach consensus on important policy issues within themselves. This is not to say there is no internal debate within the community. But at the end of a policy debate, they are able to speak with more or less one voice and to promote the same policy.

Hypothesis 1B: Operational-level engagement helps the Chinese nuclear community to recognize new areas of common interests with the United States and to become more motivated in pursuing cooperation with the United States to achieve these newly recognized common interests.

This can take place in several ways. For instance, operational-level engagement may help the Chinese nuclear community develop sophisticated understanding about the U.S. nuclear policy, which helps clarify positions and recognize common interests; engagement may help introduce American concepts and ideas into the Chinese nuclear community, which if accepted by the Chinese would help change the basis of their cost-benefit calculations, and engagement may help build the technical capacity of the Chinese nuclear community, which can help them recognize dangers that they previously ignored because of inexperience and help them recognize new areas of interest as they become more technically capable of pursuing such interests. In any case, to accept Hypothesis 1B, empirical data needs to show that at least one or several of these dynamics are at work.

Hypothesis 1C: The Chinese nuclear community is able to convince the top leadership that these new areas of common interests are real and worth pursuing in cooperation with the United States.

The Chinese nuclear community needs to demonstrate effective communication channels to influence the thinking of China's top leadership on nuclear issues. The empirical evidence needs to show that their thinking is indeed gradually embraced by the top leadership and reflected in China's official nuclear policy.

A competing hypothesis (according to the top-down trust-building theory) depicts the influence between the Chinese epistemic community and top decision makers in the reverse order (i.e., change takes place firstly among the top decision makers in the form of shifting strategic visions and strategic calculation; that change is then embraced and implemented by the Chinese nuclear community). The sequence of change that takes place at these two levels would be the key evidence to either accept or reject this hypothesis.

Similarly, for Hypothesis 2 to be accepted, we also need to test the correctness of three sub-hypotheses.

Hypothesis 2A: Operational-level engagement promotes the growth and expansion of a Chinese nuclear community that shares a common vocabulary with the U.S. nuclear community and understands important concepts that are used by the U.S. nuclear community.

This is essentially the same causal mechanism that is already reflected in Hypothesis 1A. In other words, it is a necessary condition for either type of trust to be built. Hypothesis 1A and 2A are the same.

Hypothesis 2B: Operational-level engagement helps the Chinese nuclear community to recognize and/or accept more common moral/normative principles with the United States on nuclear arms control and nonproliferation issues.

follows a set of moral principles in its nuclear policy-making that China also agrees and follows. It would be rejected if engagement actually makes the Chinese believe that the

United States is playing *realpolitik* games and following no moral principles in its nuclear policy-making, or the Chinese nuclear community perceives the United States as following a set of moral principles that conflict with Chinese nuclear ethics.

Hypothesis 2C: The Chinese nuclear community is able to convince the top leadership that the United States and China share important moral/normative principles in their respective nuclear policy thinking.

Case Studies and Main Argument

This research examines three cases: U.S.-Chinese operational-level engagement before and during CTBT negotiations, U.S.-Chinese operational-level engagement over nuclear stability and arms control, and U.S.-Chinese operational-level engagement over nuclear nonproliferation.

These three case studies represent inclusive research of all the major operational-level engagements between the two countries on nuclear issues. There are two types of operational-level engagement between the United States and China. One is concentrated engagement, which takes place in an intensive manner prior to official negotiations to solve policy disagreements. The second type of operational-level engagement is gradual engagement, which takes place in the form of long-term, regular bilateral exchanges. The case on CTBT is a case of concentrated engagement during which the United States and China conducted intensive operational-level dialogues and exchanges for a relatively short period of time that were focused on a specific issue (CTBT). The cases of U.S.-Chinese engagement on nuclear stability and arms control and U.S.-Chinese engagement

in nuclear nonproliferation are cases of long-term engagement during which the two countries conducted regular operational-level engagement for more than three decades.

These three cases provide a hard test of the bottom-up trust-building theory.¹¹³ Nuclear test ban and nuclear arms control present major consequences for China's nuclear second-strike capability that are foundational for credible nuclear deterrence. China's accession and integration into the Nuclear Nonproliferation Treaty (NPT) regime also reshaped China's global and regional security policy in a significant manner. If the empirical evidence supports the bottom-up trust-building theory in these highly sensitive national security issue areas, it will lend important credibility to the theory.

This research benefits greatly from the author's personal involvement in operational-level U.S.-Chinese nuclear engagement and the connections that the author has developed with both senior American and Chinese participants in these engagement programs. Before and during his stay in the United States, the author had the opportunity to study and work with some of the most established Chinese nuclear experts and arms control scholars for over ten years. The author had the opportunity to attend nuclear policy meetings and workshops and build connections with China's most senior nuclear scientists and arms control policy makers. Under the sponsorship of the Young Leaders Program of the Pacific Forum CSIS, Union of Concerned Scientists, the Program on Strategic Stability Evaluation (POSSE), the Project on Nuclear Issues of the Center for Strategic and International Studies (CSIS), Carnegie Endowment for International Peace, and the

¹¹³ Andrew Bennett, "Case Study Methods: Design, Use, and Comparative Advantages," *Models, numbers, and cases: Methods for studying international relations* (2004); Norrin M Ripsman and Jean-Marc F Blanchard, "A Guide to Conducting Case Studies of Economic Interdependence and Conflict," (Economic Interdependence and International Conflict: New Perspectives on an Enduring Debate, ed. by Edward D. Mansfield and Brian M. Pollins. Ann Arbor, MI: University of Michigan Press, 2003).

Italian International School on Disarmament and Research on Conflicts (ISODARCO), among others, the author has personally attended a number of important operational-level nuclear dialogues, exchanges, and other training programs including the Conference on U.S.-China Strategic Nuclear Dynamics, U.S.-China Strategic Dialogue, CSCAP Study Group meetings on Countering the Proliferation of Weapons of Mass Destruction, CSCAP Export Controls Experts Group meetings, Summer Symposia on Science and World Affairs, and various U.S.-Chinese nuclear policy-related workshops and seminars. The author also helped organize and attended the Tsinghua University Summer Symposium on Arms Control. All these events and activities provided the author with unique opportunities to get access to senior nuclear experts, scientists, policy makers, and policy practitioners from both China and the United States and to keep close and frequent communication with them. Much of the author's understanding of the historical development and impact of various U.S.-Chinese engagement programs is from personal correspondence with the senior participants of these programs.

The author was also able to obtain a large number of documents of the major dialogues, meetings, and exchange programs including meeting summaries, proceedings, and reports from the organizers of these dialogues. These documents provide a detailed accounting of views exchanged at these meetings and a thorough description of the discussions, which is very helpful for developing deep understanding about the content and background of the discussions and for detecting the change and evolution of attitudes and views on specific issues from both the Chinese and American participants.

This research also relies on primary Chinese sources collected from visiting special Chinese libraries and information centers. For instance, documents obtained from the

Information Center of Science and Technology in National Defense at Beijing provide important insight on the involvement of China's nuclear defense industry in China's nuclear arms control and nonproliferation domestic policy discussions and policy-making. The author's visit to China Arms Control and Disarmament Association (CACDA) helped the author obtain insight about the participation of China's Ministry of Foreign Affairs-affiliated organizations and nongovernmental organizations in nuclear policy discussions.

Another important way to understand the evolution of the views of the Chinese nuclear community is to conduct summative content analysis of their writings and publications between the 1950s and present. Many of the so-called "internal circulation" publications that were previously not available to the public have recently become available. These writings by Chinese nuclear weapons scientists, military personnel, arms control experts, government officials, think tank analysts, and academics make it possible to monitor domestic debates and compare their thinking on specific nuclear policy issues over time. Significant changes in frequency and intensity of writings on specific issues also reflect the shift of interests on these issues within the community. These are analyzed by using conceptual analysis tools.¹¹⁴ More importantly, this research not only analyzes the macro data and general trends of these writings but also conducts in-depth summative content analysis of these writings.¹¹⁵ Hundreds of these writings and publications were read and analyzed in order to grasp the Chinese nuclear community's evolving understanding and

¹¹⁴ See, for example, Charles P Smith, "Content Analysis and Narrative Analysis," *Handbook of research methods in social and personality psychology* (2000); Marta Indulska, Dirk S Hovorka, and Jan Recker, "Quantitative Approaches to Content Analysis: Identifying Conceptual Drift across Publication Outlets," *European Journal of Information Systems* 21, no. 1 (2012).

¹¹⁵ Hsiu-Fang Hsieh and Sarah E Shannon, "Three Approaches to Qualitative Content Analysis," *Qualitative health research* 15, no. 9 (2005).

internalization of important nuclear terms and concepts used by their American counterparts. Many of these writings and publications are made available through various databases set up by the China National Knowledge Infrastructure (CNKI), which was initiated by Tsinghua University. The CNKI databases include almost all major Chinese publications that were written over the last several decades—some dating back to as early as the 1940s—and include not only academic journals but also conference papers, conference proceedings, newspapers, yearbooks, theses, etc.

These primary Chinese sources are used to trace the development of the Chinese nuclear community. Their change of perception and thinking on major nuclear arms control and nonproliferation issues is documented by systematically examining all the operational-level engagement programs and by conducting in-depth content analysis of the writings and publications of the Chinese nuclear community. The author also collected all available historical Chinese official documents that relate to nuclear policy, including foreign and security policy guidelines reports, foreign policy review reports, proceedings of Central Meetings on Foreign Affairs Work, speeches and remarks made by national leaders, official statements, announcements, position papers, statements submitted to international governmental organizations, and speeches delivered by senior government officials on nuclear-related topics. Additional government-sponsored newspapers such as the *People's Daily* were also used to help identify change of perception and thinking at the official level. In the case of the *People's Daily*, content analysis was conducted for all its editorials and political and international news articles since 1946.¹¹⁶

¹¹⁶This analysis is conducted by making use of the People's Daily Full-Text and Graphic Database (1946-2014) (人民日报图文数据库 (1946-2014)). People's Daily was created and has been supervised by the

The primary finding of this research is that U.S.-Chinese operational-level engagement increased strategic trust at the top level but did not increase moralistic trust. For strategic trust, the case studies show that operational-level engagement played an important role in building and growing China's nuclear community and helped them develop a common vocabulary with their American counterparts; such engagement was necessary for the Chinese nuclear community to learn, accept, internalize, and spread American nuclear arms control and nonproliferation concepts and theories. Such engagement helped the Chinese nuclear community develop a much better interagency coordinating mechanism and helped them develop direct and indirect bottom-up communication channels that have been effective in promoting perception change at the top level. Such bottom-up perception change helped the Chinese to recognize more common interests with the United States and to become increasingly motivated to cooperate with the United States to achieve these newly identified common interests. Operational-level engagement also played an important role in building up the technical capacity of the Chinese nuclear community, making it easier for the two countries to achieve the newly identified common interests.

As for moralistic trust, the case studies show that operational-level engagement actually makes the Chinese nuclear community believe that U.S. nuclear policy-making is guided by a few principles—none of which overlap with China's traditional nuclear moral/normative principles. Operational-level engagement reveals and reinforces the identity gap between China and the United States. The Chinese nuclear principles are based on their identification with the developing countries rather than the United States.

Central Committee of the Communist Party of China. It is widely viewed as the most authoritative source of direct information on the policies and viewpoints of the Party and the government.

Operational-level engagement convinces the Chinese nuclear community that they should follow *realpolitik* principles in their nuclear policy-making and should give less consideration to moral/normative principles, thus undermining the basis for building “moralistic trust” between the two countries.

The same findings were observed for both long-term operational-level engagement (the cases on U.S.-Chinese engagement on nuclear stability and arms control and U.S.-Chinese engagement on nuclear nonproliferation) and concentrated operational-level engagement (the case on CTBT). These case studies represent a comprehensive and systematic study of all the major operational-level engagements between the two countries on nuclear issues and have important theoretical and policy implications.

Plan of the Dissertation

The rest of the dissertation is structured as follows. Chapter two provides a detailed study of U.S.-Chinese operational-level engagement on the issue of CTBT. This is a case of concentrated engagement during which the United States and China conducted intensive operational-level dialogues and exchanges on CTBT related issues for a relatively short period of time. Before such engagement, there was essentially no specialist community in China that had a sophisticated understanding about nuclear arms control issues. Chinese official policy had been very much opposed to nuclear test ban for decades. Such engagement introduced Chinese nuclear scientists, foreign ministry officials, military personnel, and security experts to U.S. domestic debates around CTBT and raised their interests and technical capacity in conducting policy research on CTBT and other nuclear arms control issues. These engagement programs played a big role in forming and

growing the Chinese nuclear community and changed their perceptions about the potential benefits and costs for China to sign the test ban treaty. Such change of perception at the operational level initiated domestic discussions that ultimately influenced Chinese official thinking at the top level.

Chapter three analyzes one of the long-term engagement cases: U.S.-Chinese engagement on nuclear stability and arms control. This chapter reviews all the major engagement programs over the past three decades and analyzes their influence on the expansion and professionalization of the Chinese nuclear community. It looks into the process of how such engagement helped to build a common vocabulary between the Chinese nuclear community and their American counterparts and shifted Chinese thinking on a number of important concepts on nuclear arms control. China's gradual development of its nuclear strategy was also greatly influenced by this process. These engagement programs also provided insight for the Chinese nuclear community to understand how the United States deliberated on nuclear stability and arms control issues, which significantly influenced how the Chinese view the role of moral and normative principles in their nuclear policy-making.

Chapter four studies the other case of long-term engagement: U.S.-Chinese engagement on nuclear nonproliferation. Since the early 1980s, a number of American organizations have carried out a range of operational-level engagement programs with China. These programs focused not only on policy discussions that influenced Chinese perceptions about the dangers of proliferation but also on technical trainings that helped to significantly build up the technical capacity of the Chinese nuclear community to draft nonproliferation regulations and carry out nonproliferation policies through enhanced

interagency coordination and strengthened export control. The top leadership's endorsement of China's membership in NPT and their support for a legally based export control regulation system were greatly influenced by the change of perception at the operational level. Operational-level engagement, however, shaped the perception of the Chinese nuclear community in a way that undermined moralistic trust between the two sides.

Chapter five draws conclusions from the case studies and summarizes why and how operational-level engagement has been helpful for increasing Chinese strategic trust toward the United States but was not successful in building moralistic trust. It explores the implications for IR theories, especially the Track II dialogue and trust-building literature. It also offers policy implications on how to better manage existing and future U.S.-Chinese engagement programs on nuclear issues and how to deal with existing policy and perception gaps between the two countries.

CHAPTER TWO

CONCENTRATED OPERATIONAL-LEVEL ENGAGEMENT: THE COMPREHENSIVE TEST BAN TREATY NEGOTIATIONS

The signing of the CTBT is a case that represents a milestone in the evolution of China's nuclear policy for at least two reasons. First, CTBT is the first international nuclear arms control negotiation that China took part in. CTBT requires state parties to ban all kinds of nuclear explosions and has significant implications for China's very limited nuclear capability.

Second, China's decision to actively participate in the CTBT negotiations and ultimately sign the treaty marked a dramatic shift from its previous policy toward the nuclear test ban. China vehemently opposed the Partial Test Ban Treaty (PTBT) of 1963 and the Threshold Test Ban Treaty (TTBT) of 1974. In the early to mid-1980s, China did not allow the Conference on Disarmament to even set up an *ad hoc* committee to discuss the issue of a comprehensive nuclear test treaty by vetoing the proposal for five consecutive years. However, China ultimately participated in the CTBT negotiations and became one of the first countries to sign the treaty in September 1996. Why did China completely change its attitudes and position about the nuclear test ban in this time period? What role did China's nuclear community play in this process, as compared with the role played by China's top political leaders, in bringing about this policy change? And to what extent was the bottom-up type of engagement between China and the United States helpful in generating this policy change in China?

In addition, the CTBT case is an example of concentrated engagement in the sense that a large number of operational-level engagement programs took place on high frequency during a short period of time prior to and during official negotiations. In comparison, the other two case studies in this research—U.S.-China nuclear strategic stability dialogue and U.S.-China nuclear nonproliferation interaction—are cases of gradual engagement that took place in the form of long-term regular bilateral exchanges, as well as in the form of unilateral observing and learning. This chapter on CTBT, therefore, seeks to examine the impact of concentrated operational-level engagement in trust building between the United States and China.

This chapter reviews the process of U.S.-China operational-level engagement over CTBT. It delineates how operational-level engagement was able to help build and grow China's nuclear arms control community. It analyzes the impact of this engagement on China's internal interagency policy-making mechanism and examines whether operational-level engagement was able to promote bottom-up communication and influence top-level decision making. It then identifies major issues that operational-level engagement was able to help the United States and China reach consensus on in formal CTBT negotiations. In the end, it examines the impact of operational-level engagement on strategic trust and moralistic trust between the United States and China, respectively. The main finding is that operational-level engagement considerably increased Chinese strategic trust toward the United States because it convinced the Chinese that it shared more common interests with the United States than it originally recognized. There is no evidence of increased moralistic trust because engagement did not lead to the convergence of moral/normative principles between the two sides.

Previous Chinese Attitudes toward the Nuclear Test Ban

China opposed all forms of a nuclear test ban throughout the 1960s–1980s. This was consistent with Mao's view that superpowers tend to use their nuclear superiority to coerce and bully less advanced countries.¹¹⁷ On August 23, 1962, the Chinese government received a notification from the Soviet government that the Soviet Union was going to accept the proposal made by U.S. secretary of state Dean Rusk about negotiating a treaty for preventing nuclear proliferation. China strongly opposed this idea and expressed repeatedly to the Soviets that Rusk's proposal was aimed at imposing the obligation of nuclear nonproliferation on those socialist countries that did not yet have nuclear weapons and that its primary target country was China. The Soviet Union repudiated China's claim in a memo sent to the Chinese government on April 20, 1963, and insisted that it would negotiate and sign an agreement on nuclear nonproliferation with the United States.¹¹⁸ The Soviet Union then went ahead and signed the Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space, and Under Water (also known as the Partial Test Ban Treaty [PTBT]) on July 25 with the United States and the United Kingdom.¹¹⁹ One of the primary purposes of the PTBT was to prevent further proliferation of nuclear weapons beyond existing nuclear weapons states at that time. It prohibited nuclear tests in the atmosphere, in outer space, and under water but did not ban

¹¹⁷Wei Wang and Jiefeng Zhang, "A Brief Analysis of the Art of War Control by Mao Zedong in the Korean War (略论抗美援朝战争中毛泽东的战争控制艺术)," in *Symposium in Commemoration of the 50th Anniversary of the Korean War (纪念抗美援朝战争胜利50周年学术讨论会)*(Nanjing2003); Guoyin Cheng, "Mao's Nuclear Strategy and Implementation," *Sichuan Party History* (1997).

¹¹⁸Taiping (王泰平) Wang, *Diplomacy of the People's Republic of China, 1957-1969 (中华人民共和国外交史, 1957-1969)*(World Knowledge Publishing House (世界知识出版社), 1998).

¹¹⁹"Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and under Water," United Nations, http://www.un.org/disarmament/WMD/Nuclear/pdf/Partial_Ban_Treaty.pdf.

underground nuclear tests. This kept the option open for the three countries to continue conducting nuclear tests and improving nuclear weapon designs.

China immediately published a statement that accused the three nuclear powers of using the PTBT to reinforce their monopoly on nuclear weapons and undermine the objective of nuclear disarmament.¹²⁰ Two days later, Premier Zhou Enlai wrote a letter to a few heads of states to once again express China's opposition to the treaty. On August 15, China made another statement restating China's discontent and condemning the Soviet Union for making an utterly wrong policy choice.¹²¹ One year later, China tested its first nuclear device.

After the PTBT, the United States, the Soviet Union, and the United Kingdom continued trilateral discussions on an additional test ban throughout the 1970s and early 1980s. In 1974 the United States and the Soviet Union concluded the bilateral Threshold Test Ban Treaty (TTBT), limiting underground nuclear weapons tests to yields below the equivalent of 150 kilotons (150 kt) of the explosive TNT.¹²² Two years later, the United States and the Soviet Union signed another bilateral treaty to restrain so-called "peaceful nuclear explosions."¹²³ In this treaty between the United States and the Union of Soviet Socialist Republics on underground nuclear explosions for peaceful purposes, both countries agreed not to carry out any individual nuclear explosions having a yield

¹²⁰Longbiao (钟龙彪) Zhong, "Analyses of the Evolution of China's Policy Concerning International Arms Control (中国国际军备控制政策演变论析)," *Contemporary China History Studies (当代中国史研究)* 16, no. 5 (2009).

¹²¹Wang, *Diplomacy of the People's Republic of China, 1957-1969 (中华人民共和国外交史, 1957-1969)*.

¹²²Ola Dahlman, Svein Mykkeltveit, and Hein Haak, *Nuclear Test Ban*, vol. 1(Springer, 2009).

¹²³"Treaty between the United States of America and the Union of Soviet Socialist Republics on Underground Nuclear Explosions for Peaceful Purposes (and Protocol Thereto)," The State Department, <http://www.state.gov/www/global/arms/treaties/pne1.html>.

exceeding 150 kilotons and not to carry out any group explosion (consisting of a number of individual explosions) having an aggregate yield exceeding 1,500 kilotons.¹²⁴

For China, all of these efforts by nuclear superpowers to ban or limit nuclear testing were condemned as “a big fraud to fool the people of the world” and to “tie the hands of all peace-loving countries.”¹²⁵ China argued that banning nuclear tests would not stop superpowers from manufacturing or using nuclear weapons but would hinder other countries from strengthening their defense. Chinese arms control statements and analyses have always focused on the importance of No First Use (NFU) commitment and on steps aimed at complete elimination of nuclear weapons.¹²⁶

China’s Arms Control Community before CTBT

China’s experience with arms control and nonproliferation had been extremely limited by the 1980s, particularly when compared with that of other nuclear weapons states—the United States, the Soviet Union, Britain, and France. China went into a de facto self-isolation after Chinese-Soviet separation in the late 1950s and early 1960s. China was by and large absent from important international institutions and had minimal, if any, interactions with other countries in nuclear arms control talks or negotiations, such as the Partial Test Ban Treaty (1963), the Nuclear Nonproliferation Treaty (1968), the Anti-Ballistic Missile Treaty (1972), the Threshold Test Ban Treaty (1974), and the Treaty on Peaceful Nuclear Explosion (1976).

¹²⁴ The treaty was signed in April 1976 and entered into force on December 11, 1990.

¹²⁵ “Statement of the Government of the People's Republic of China (中华人民共和国政府声明),” *The People's Daily*, October 17 1964.

¹²⁶ William SW Chang, “China and the Comprehensive Test Ban Treaty Negotiations,” *Stanford Journal of East Asian Affairs* 1(2001).

China only joined the International Atomic Energy Agency (IAEA) in 1983 and signed the NPT in 1992. The CTBT (signed in 1996) is the first nuclear arms control treaty that China actively negotiated. Before the CTBT negotiations officially started in 1993, China was seen as the wild card in the negotiations as other countries understood very little about the Chinese position.¹²⁷

Before the 1990s, Chinese top political leaders paid little attention to issues of arms control. They were generally very much skeptical about the utility of arms control. The term “arms control” had a negative connotation in the mind of Chinese decision makers. It was seen as what the superpowers used to consolidate their own quantitative and qualitative advantages in military technology and capability and to avoid comprehensive and complete disarmament.¹²⁸ The dominant view was that arms control was a “political smokescreen for the U.S.-Soviet ‘nuclear deadlock’ since the 1960s and for the unprecedented arms competition that seeks to obtain overwhelming nuclear superiority.” They believed the nuclear superpowers used this “to implement nuclear blackmail diplomacy and aim to achieve the goal of coercion without having to resort to ‘suicidal’ nuclear war.”¹²⁹

There had been very limited official interaction between officials of China’s Ministry of Foreign Affairs and their colleagues from other countries. For example, Qian Jiadong, China’s first Special Ambassador for Disarmament Affairs (裁军大使), had no arms

¹²⁷ Alastair Iain Johnston and MM May, *The Cox Committee Report: An Assessment* (Center for International Security and Cooperation, Stanford University, 1999).

¹²⁸ Huaqiu (刘华秋) Liu, *Handbook on Arms Control and Disarmament (军备控制与裁军手册)* (National Defense Industry Press (国防工业出版社), 2000).

¹²⁹ Fang (张放) Zhang, "An in-Depth Analysis of the U.S. Imperialist 'Arms Control' Theory (美帝国主义“军备控制”论的透视)," *World Affairs (世界知识)* 24(1963).

control experience when he took this position in Geneva in June 1983. In Chinese rhetoric, the term mostly used is “arms control struggle” (军控斗争). The view was that arms control was a new form of war in which countries fought for their survival and benefits.¹³⁰ According to the Chinese perspective, Western countries dominated the international struggle over arms control and used it against socialist and developing countries and forced them into arms control. As a result, China must “counter this policy of power politics and hegemonism” and fight Western countries to “protect socialist countries’ security interests and to preserve world peace.”¹³¹

U.S.–China Operational-Level Engagement

There was no high-level official communication on the issue of CTBT before the early 1990s. The U.S. government had only focused on China’s arms control policies sporadically and often in a politically charged environment. The primary focus of the U.S. government had been on Soviet nuclear capability.¹³² The rapid improvement of the U.S.-Chinese relationship since the late 1970s further reduced the U.S. government’s concern about China.¹³³ Conversely, American NGOs and universities maintained continuous and close relationships with the emerging Chinese arms control community, including low-

¹³⁰Qiang (石强) Shi, "Nuclear Arms Control between the United States and Russia (论美俄之间的核军备控制)" (Northwestern Normal University (西北师范大学), 2007).

¹³¹Qing (刘卿) Liu, "On the Characters of the Struggle of International Arms Control (论国际军控斗争的性质)" (Renmin University of China (中国人民大学), 2004).

¹³²Steve Weber, *Cooperation and Discord in Us-Soviet Arms Control*(Princeton University Press Princeton, 1991).

¹³³Chenghu (朱成虎) Zhu, *Evolution of Sino-U.S. Relationship and Future Trend (中美关系的发展变化及其趋势)*(Jiangsu People's Publishing House (江苏人民出版社), 1998).

and mid-level officials from the Foreign Ministry and experts and analysts from think tanks and universities.¹³⁴

Starting in the late 1980s, in anticipation of the upcoming CTBT negotiations, the scientific communities of the United States felt the need to meet with their Chinese counterparts and discuss potential technical issues before the formal negotiations started. Toward the end of the Cold War, American nuclear scientists had developed a good working relationship with their Soviet colleagues, and such U.S.-Soviet engagement contributed to cooperation between the two governments on nuclear arms control issues.¹³⁵ Encouraged by the successful U.S.-Soviet scientific engagement, American scientists were eager to develop a similar relationship with their Chinese colleagues. On the Chinese side, Chinese nuclear scientists also saw it necessary to start some type of dialogue with the United States to prepare for the anticipated CTBT negotiations. Such U.S.-Chinese exchanges began in the late 1980s and continued in the early 1990s and during the official negotiations in 1995 and 1996. Table 2 provides a summary of the major bilateral visits between the U.S. and Chinese nuclear scientific communities during 1993–1996.

Table 2 Summary of Major Bilateral Visits between U.S. and Chinese Nuclear Scientific Communities before and during the CTBT Negotiations, 1993–1996

¹³⁴Wendy Frieman, *China, Arms Control, and Nonproliferation*(Psychology Press, 2004).

¹³⁵Adler, "The Emergence of Cooperation: National Epistemic Communities and the International Evolution of the Idea of Nuclear Arms Control."

Exchange Program	Date	Participating Party (U.S.)	Participating Party (China)	Place	Issues Discussed
Visits by Experts from Natural Resources Defense Council ¹³⁶	June 1-4, 1993	NRDC, LLNL	IAPCM, National Defense Information Center, CPAPD, CICIR, Beijing University of Aeronautics and Astronautics	Beijing	Nuclear strategy and policy, nuclear weapons maintenance programs, nuclear testing plans, technical problems facing CTBT, CTBT verification regime
Visits by Experts from National Academy of Sciences ¹³⁷	Early 1996	Committee on International Security and Arms Control (CISAC) of the National Academy of Sciences	IAPCM, experts and scientists from China's nuclear weapons establishment and missile research institutes	Beijing	Nuclear stockpile stewardship, CTBT verification
Visits by Chinese Academy of Engineering Physics to the U.S. ¹³⁸	March 23 to April 5, 1996	Cooperative Monitoring Center of Sandia National Laboratory, LANL, NRDC, FAS, SBU, Princeton University	CAEP (Chinese Academy of Engineering Physics)	Multiple places in the U.S.	Treaty monitoring and verification technologies, CTBT on-site inspection, data analysis under CTBT, role of U.S. national laboratories in promoting arms control, peaceful nuclear explosion
U.S.-China Lab-to-Lab Technical Exchange Program ¹³⁹	1995-1999	U.S. national laboratories	CAEP, NINT	Multiple places in the U.S. and China	CTBT international monitoring system, CTBT data analysis, on-site inspection, CTBT confidence-building measures

¹³⁶Zou, Yunhua (邹云华). 1994. Comprehensive Nuclear Test Ban Is an Inevitable Historical Development (全面禁止核试验是形势发展的必然: 写在《全面禁止核试验条约》谈判前夕). *International Studies (国际问题研究)* (1):5-12.

¹³⁷Zhao, Hong (赵宏). 2006. Track Two Dialogue between the U.S. and China on CTBT Negotiations (二轨外交与中美全面禁止核试验条约谈判), Institute of International Studies (国际问题研究所), Tsinghua University (清华大学), Beijing.

¹³⁸Ibid.

¹³⁹Prindle, Nancy. 1998. U.S.-China Lab-to-Lab Technical Exchange Program. *The Nonproliferation Review* (Spring-Summer):111-118.

Dialogue between Chinese Scientists Group on Arms Control and U.S. National Academy of Sciences

The Chinese Scientists Group on Arms Control (CSGAC) of the Chinese People's Association for Peace and Disarmament (CPAPD, 中国人民和平与裁军协会), and the Committee on International Security and Arms Control (CISAC) of the U.S. National Academy of Sciences (NAS) have been meeting since 1989 to discuss nuclear arms control, nuclear nonproliferation, nuclear energy, and regional security issues, with the goal of reducing the possibility of nuclear weapons use and reducing nuclear proliferation in the world at large.¹⁴⁰

The NAS first began conducting dialogues with Russian scientists starting in 1981. This U.S.-Russian Track II dialogue, built on a foundation of scientist-to-scientist interaction, allowed the CISAC to discuss technical and potentially sensitive issues in international security, arms control and disarmament with their Russian colleagues. Even when official relations were strained, the CISAC was able to sustain links to Russian senior weapon scientists, politicians, and military officers.¹⁴¹ This successful experience encouraged the U.S. National Academy of Sciences to initiate a similar dialogue with Chinese nuclear scientists.¹⁴²

¹⁴⁰n"English - Chinese Chinese - English Nuclear Security Glossary," Chinese People's Association for Peace and Disarmament and the Committee on International Security and Arms Control (CISAC) of the U.S. National Academy of Sciences, http://sites.nationalacademies.org/PGA/cisac/PGA_050966.

¹⁴¹n"Committee on International Security and Arms Control," U.S. National Academy of Sciences http://sites.nationalacademies.org/PGA/cisac/PGA_048467.

¹⁴²Zuoyue Wang, "Us-China Scientific Exchange: A Case Study of State-Sponsored Scientific Internationalism During the Cold War and Beyond," *Historical studies in the physical and biological sciences* (1999).

The first dialogue took place in 1989. The Chinese People's Association for Peace and Disarmament was the Chinese co-organizer. The main U.S. participants were prominent NAS scientists and experts working on arms control and international security issues. The Chinese participants were mainly scientists and experts from the military nuclear establishment and the PLA. They called themselves the Scientists Group on Arms Control of CPAPD.¹⁴³ Some of the Chinese participants were not only prominent nuclear scientists but also senior government officials within the defense industry bureaucracy. Among them were Zhu Guangya (朱光亚), a leading nuclear weapons scientist and the head of the Science and Technology Committee of the Commission of Science, Technology, and Industry for National Defense (COSTIND),¹⁴⁴ and Qian Jiadong, China's first ambassador for disarmament affairs. This group of Chinese scientists and experts later became the core members of the COSTIND's Arms Control Experts Group. This group held internal preparatory meetings before the dialogue with U.S. National Academy of Sciences. These internal meetings later became a platform for broader discussions among China's arms control community.

The annual dialogue usually takes place in the form of a three-day seminar during which both Chinese and U.S. experts present papers and have discussions. The meetings raised considerable Chinese interests in more discussions, and the number of Chinese participants grew quickly. In the first dialogue in 1989, a total of eight Chinese experts

¹⁴³Banning N Garrett and Bonnie S Glaser, "Chinese Perspectives on Nuclear Arms Control," *International Security* (1995).

¹⁴⁴ COSTIND was responsible for managing China's defense industry. Many of its officials and staffs wore PLA uniforms. In 1998, COSTIND was separated into two organizations: one military organization —the General Armament Department of the PLA, and one civilian organization —the State Administration for Science, Technology and Industry for National Defense (SASTIND) which is a complete civilian agency under the administration of the Ministry of Industry and Information Technology.

attended, and by the third dialogue in 1992, 28 Chinese experts attended the meeting.¹⁴⁵ Since 1995, based on a Chinese proposal, occasional special, small-scale seminars were organized in addition to the regular annual meeting in order to have in-depth discussions on specific issues.¹⁴⁶

During 1995–96, discussions between American and Chinese nuclear scientists focused heavily on CTBT related issues. On February 7–8, 1996, CISAC and CSGAC experts held a two-day seminar on CTBT in Beijing at the Institute of Applied Physics and Computational Mathematics. Senior American and Chinese scientists had an extensive exchange on the CTBT verification system, peaceful nuclear explosion, and other important technical issues that the U.S. and Chinese negotiators at the CD had not been able to reach agreement on.

In this meeting, Wolfgang Panofsky, a professor at the Stanford Linear Accelerator Center of Stanford University, had a discussion with his Chinese colleagues on the monitoring and verification of CTBT. He mentioned that in August 1995, President Clinton had made a decision to pursue a complete zero-yield test ban treaty. France had also determined that CTBT should prohibit any nuclear explosion that produced nuclear energy. It would be more difficult to verify a zero-yield CTBT than a CTBT that allowed a low-yield nuclear test such as 1 kilogram or 1 kiloton nuclear tests, Panofsky argued. But he also pointed out that the military significance of conducting low-yield nuclear tests (e.g., 1 kilogram or 1 kiloton) was so small that it was negligible. The more

¹⁴⁵Evan S Medeiros, *Reluctant Restraint: The Evolution of China's Nonproliferation Policies and Practices, 1980-2004*(Stanford University Press, 2007).

¹⁴⁶Hong (赵宏) Zhao, "Track Two Dialogue between the U.S. And China on CtbT Negotiations (二轨外交与中美全面禁止核试验条约谈判)" (Tsinghua University (清华大学), 2006).

important thing was to add some article into the treaty to allow the adoption of new and less expensive verification technologies in order to ensure that the verification regime under the treaty would be effective, as well as sustainable, over the long term. He also discussed the importance of increasing transparency for verification purposes.¹⁴⁷

American scientist Richard Garwin gave the Chinese scientists an introduction to the U.S. nuclear weapons stockpile stewardship program. The draft CTBT under discussion at that time prohibited any country from conducting any type of nuclear explosion experiment. Under this stipulation, as Garwin argued, the United States would not make any new weapon designs, except making necessary improvements to its existing nuclear weapons in order to maintain the safety, security, and reliability of the existing stockpile.

According to the Strategic Arms Reduction Treaty (START I and START II), the United States was going to reduce the number of its nuclear weapons designs from twenty-five to seven.¹⁴⁸ The focus of its nuclear weapons management was going to be on maintaining the credibility of the weapons' safety, security, and reliability. Taking into consideration the fact that China's nuclear weapons development program was different from that of the United States, Garwin suggested that it would be helpful for China to have a good understanding of the U.S. nuclear weapons stockpile stewardship program in order to safely and effectively maintain China's own nuclear stockpile after the nuclear test ban. Garwin also pointed out a few potential problems faced by the U.S. stockpile stewardship program including standardization, remanufacture, infrastructure, etc. The solution was to develop a technical capability to examine the parts and materials inside the weapons

¹⁴⁷Ibid.

¹⁴⁸Lisbeth Gronlund et al., "Making Smart Security Choices: The Future of the U.S. Nuclear Weapons Complex," (Cambridge, MA: Union of Concerned Scientists, 2013).

without testing. For that purpose, the United States was making efforts to retain the scientific knowledge and technical skills by maintaining the science and engineering institutions of the nuclear weapons complex. The introduction of the U.S. stockpile stewardship program to the Chinese enhanced their confidence that China could also maintain its nuclear stockpile without testing.¹⁴⁹ This recognition was essential for Chinese scientists' support of the CTBT.¹⁵⁰

One of the major concerns of China was the issue of peaceful nuclear explosion. With much less testing experience with peaceful nuclear explosion, Chinese scientists believed that peaceful nuclear explosions were useful for large-scale infrastructure construction, mining, and dealing with sudden natural disasters. Their view was that peaceful nuclear explosions would not facilitate the horizontal proliferation of nuclear weapons, would not be helpful for advancing nuclear weapons technology, and would be distinguishable from military nuclear weapons explosion experiments under an effective international monitoring and verification system.¹⁵¹ Chinese scientists Hu Side and He Zuoxiu led the discussion on peaceful nuclear explosion with the American delegation.

U.S.-China Arms Control Technical Exchange Program

The U.S.-China Arms Control Technical Exchange Program (ACE), also known as the U.S.-China Lab-to-Lab Technical Exchange Program (CLL), was in nature an unofficial

¹⁴⁹Yulong (张玉龙) Zhang and Debing (唐德兵) Tang, "Scientific Experiment Programs of the U.S. Nuclear Warhead Stockpile Management (美国核弹头库存管理中的科学实验项目)," *Modern Military (现代军事)* 1(2008).

¹⁵⁰Yunhua (邹云华) Zou, "China and the Ctbt Negotiations," *Center for International Security and Cooperation (CISAC), Stanford University, CISAC Working Papers* (1998).

¹⁵¹Dongfeng (田东风) Tian and Side (胡思得) Hu, "Peaceful Nuclear Explosion and Comprehensive Nuclear Test Ban (和平核爆炸与全面禁止核试验)," *Modern Military (现代军事)* 6(1996).

exchange. It did not include government officials in the exchanges but derived its authority from government officials' oversight on each side.

This program started as some scientists at the Los Alamos National Laboratory used their previous connections with their Chinese colleagues to invite them for a visit. In February 1994, Qian Shaojun and Hu Side, both prominent nuclear weapons scientists, led a six-member delegation of China's nuclear complex and visited the Sandia National Laboratories (SNL), Lawrence Livermore National Laboratory (LLNL), and Los Alamos National Laboratory (LANL). At the Lawrence Livermore National Laboratory, their visit focused on environmental restoration; links of LLNL with industry; and activities on nonproliferation, arms control, and international security.

This visit convinced the United States that there was potential for the United States and China to cooperate on CTBT and other nuclear arms control and nonproliferation issues. Following this, in July 1994, Deputy Assistant Secretary of State Robert Einhorn requested that the U.S. Department of Energy (DOE) establish scientific interactions with its Chinese counterpart.¹⁵² This set in motion the policy process that ultimately developed the framework for interactions between American and Chinese nuclear weapons laboratories. In October 1994, the director of the Los Alamos National Laboratory paid for a follow-up visit to China that helped move the process forward.

In January 1995, the directors of the U.S. national laboratories proposed to CAEP an exchange program that would focus on technical issues in the areas of nonproliferation, arms control, and nuclear materials protection, control, and accounting. CAEP was also

¹⁵²Nancy Prindle, "U.S.-China Lab-to-Lab Technical Exchange Program," *The Nonproliferation Review*, no. Spring-Summer (1998).

happy to be treated as an equal partner of the U.S. national laboratories and accepted this proposal. The ACE program was born.

The primary U.S. motivation for establishing the ACE program was the recognition that professional relationships between American and Chinese nuclear scientists that developed out of these exchanges could serve as a means for increasing trust and developing common approaches for addressing issues of concern to national and international security. The main objectives were

1. To provide technical contributions to arms control and nonproliferation efforts in the United States and China through joint development and deployment of integrated systems of modern technologies.
2. To explore new technical means for building mutual trust based on information shared about the operations and management of nuclear facilities, while at the same time protecting the national security interests of both the United States and China.
3. To establish long-lasting professional relationships as a basis for understanding between U.S. and Chinese scientists concerned with arms control, nonproliferation, and regional stability in Asia.¹⁵³

U.S. participants in the ACE program were scientists from Sandia National Laboratories (SNL), Lawrence Livermore National Laboratory (LLNL), and Los Alamos National Laboratory (LANL). Their Chinese counterparts were nuclear scientists from the China Academy of Engineering Physics (CAEP) and the Northwest Institute of Nuclear

¹⁵³Ibid.

Technology (NINT). NINT was included in this exchange because it was in charge of conducting and analyzing China's nuclear tests. As for the CTBT negotiations, NINT played a key role in regard to the verification of the treaty. Under CTBT, NINT has the responsibility of implementing verification technologies for CTBT's International Monitoring System.

The ACE program continued until 1999. According to U.S. analysts, under this exchange program, the United States developed a technical understanding of the status and key players of China's nuclear weapons program. Such exchanges were very important for the United States because the United States used to have connections with China's first-generation nuclear scientists, most of whom were educated between 1930 and 1950 in the United States, Britain, Germany, and France. But as China's first-generation nuclear scientists turned over the leadership of their program to a second generation of scientists who were mostly trained in China and the Soviet Union, the United States lost its connection with the key players of China's program.¹⁵⁴ The ACE program provided an opportunity for the United States to get to know this new generation of Chinese nuclear scientists and to rebuild some of the connection. This channel of communication between American and Chinese nuclear scientists opened a window for the United States to obtain up-to-date information about China's nuclear program and policy. Such information was very important for the United States as it was trying to influence China's policy over CTBT, nonproliferation, and nuclear security.

By 1997, the Lab-to-Lab Exchange Program had sponsored five major workshops and several smaller meetings:

¹⁵⁴ Johnston and May, *The Cox Committee Report: An Assessment*.

- Comprehensive Test Ban Monitoring Technologies Workshop (January 1996)
- Workshop on Material Protection Control and Accounting Technologies (January 1996)
- Cooperative Monitoring Workshop (March 1996)
- Atmospheric Sciences and Nonproliferation Workshop (June 1997)
- Workshop on the Technical Expertise Applied to the Control of Nuclear Technologies for the Prevention of Nuclear Proliferation (August 1997)¹⁵⁵

To support official CTBT negotiations in Geneva, American and Chinese scientists focused on CTBT verification technology and sought to reach agreement on the CTBT verification mechanism. Their exchanges during this period were focused on the following issues:

1. Establishing a common understanding about the methodology to be used in the CTBT verification system for collection and analyzing data
2. Improving their capability and increasing their experience for data processing
3. Encouraging joint participation in the early phase of the implementation and testing of the CTBT verification system and building mutual confidence through enhancing transparency to the extent that national security information would not be compromised
4. Building mutual confidence in on-site inspection without compromising national security information.

¹⁵⁵Wen L Hsu, "The Impact of Government Restructuring on Chinese Nuclear Arms Control and Nonproliferation Policymaking," *The Nonproliferation Review* 6, no. 4 (1999).

Table 3 is a summary of the cooperative research projects that focused on CTBT-related issues.¹⁵⁶

Table 3 CTBT-Related Cooperative Research Projects under ACE

Area of Cooperation	Objectives	Chinese Partners
Data Handling (i.e. authentication and visualization)	Increase experience and confidence in methods to analyze and present data; Develop common technical approaches	CAEP
Data Analysis for CTBT International Monitoring System	Develop common experience base in data analysis; Understand seismic baselines	IAPCM NINT
On-Site Inspections	Simulation exercises to develop common understanding and approaches	IAPCM NINT
Remote Monitoring (Authenticated Transportation Tracking and Monitoring)	Enhance systems for application in China	CAEP
Atmospheric Modeling	Develop regional monitoring and emergency response capability	IAPCM

During March 23 to April 5, 1996, a delegation from the Chinese Academy of Engineering Physics was invited to visit a number of U.S. national labs and research institutes. The discussion was focused on CTBT monitoring and verification technologies, CTBT on-site inspection, data analysis under CTBT, role of U.S. national laboratories in promoting arms control, and peaceful nuclear explosion. The Chinese delegation included

¹⁵⁶Nancy Prindle, "U.S.-China Lab-to-Lab Technical Exchange Program," *ibid.*, no. Spring-Summer (1998).

Li Youping, Chen Xueyin, Wang Deli, Li Bin, and other Chinese nuclear scientists. They visited the Cooperative Monitoring Center of Sandia National Laboratory, Los Alamos National Laboratory, Natural Resources Defense Council, Federation of American Scientists, State University of New York at Stony Brook, and Energy and the Environment Research Center at Princeton University.¹⁵⁷

American scientists explained their views about CTBT on-site inspection—how to build confidence through inspection, deter treaty violations, and enhance information-collection capability. They introduced to Chinese scientists the DOE's Seven Years' Plan of Technology Research and Development for the Monitoring and Verification of the Comprehensive Test Ban Treaty. The main purpose of the plan was to improve U.S. technical capability to detect the yield of a potential nuclear test, to increase the credibility of its assessment, and to reduce the false alarm rate. Chinese scientists were informed that China (and Northwestern China in particular), the Middle East, and North Africa were going to be the main regions that the United States would like to prioritize for CTBT monitoring and inspection.

American and Chinese scientists had an exchange on the challenges of processing data under CTBT. Potentially useful data would include both data collected through national technical means (NTM) and sharable data (i.e., data collected by the International Monitoring System and during on-site inspections). There was already some data processing technology available at that time, but whether all such data should be

¹⁵⁷Xueyin (陈学印) Chen and Deli (王德礼) Wang, "U.S. Visit Report: Technical Information Regarding Nuclear Arms Control, Monitoring, and Verification, March 23- April 5, 1996 (访美专题汇报----核军控、检测、核查技术方面信息 (1996 年 3 月 23 日-4 月 5 日)), "(Chinese Academy of Engineering Physics, 1996).

submitted to the International Data Center and be shared with all states' parties still needed to be considered. There were different views among the expert community regarding the data processing capability of the International Data Center and regarding whether there was available data-processing software to be shared. Much of the discussion between the U.S. and Chinese scientists was devoted to reaching consensus on this issue.

Another major issue discussed during this visit was peaceful nuclear explosion. Chinese nuclear scientists believed that peaceful nuclear explosion could have important values for civilian construction and for natural disaster prevention. This was probably due to the Chinese nuclear scientists' lack of testing experience with peaceful nuclear explosions. By contrast, both the United States and Soviet Union had conducted many more tests on peaceful nuclear explosion and found that peaceful nuclear explosion was less useful than they previously thought.¹⁵⁸ However, the Chinese view had greatly influenced Chinese official position during the CTBT. During this visit, American scientists held an extensive discussion with their Chinese colleagues on potential benefits and problems for allowing peaceful nuclear explosion under CTBT. On a workshop organized jointly by the Natural Resources Defense Council, State University of New York at Stony Brook, and Princeton University, nuclear physicist Frank von Hippel explained the lessons that the United States learned during its history of conducting peaceful nuclear explosions and provided his analysis on the feasibility of distinguishing peaceful nuclear explosions from military nuclear tests. Chinese scientists also had a discussion with experts from the Natural Resources Defense Council on the potential impact of not banning peaceful

¹⁵⁸Trevor Findlay, *Nuclear Dynamite: The Peaceful Nuclear Explosions Fiasco*(Rushcutter's Bay, N.S.W.: Brassey's Australia, 1990).

nuclear explosion on major nuclear powers' capability for continuing the advancement of their nuclear weapons development.¹⁵⁹

Dialogue Organized by the Natural Resources Defense Council

The Natural Resources Defense Council (NRDC) is a nongovernmental U.S. environmental organization with its headquarters in New York. During the 1990s, nuclear arms control experts at NRDC were very active in promoting U.S.-Chinese scientific exchange on nuclear arms control and nonproliferation issues. NRDC experts not only served on some of the U.S. delegations to U.S.-Chinese Track II dialogues, but they also initiated and organized their own exchange programs with Chinese nuclear scientists.

On September 23, 1992, the United States conducted its 1,030th and last nuclear weapon test at the Nevada test site. One day later, the U.S. Congress passed the Exon-Hatfield-Mitchell nine-month test moratorium legislation that limited the number and purpose of any additional testing and set the date for ending U.S. testing on September 30, 1996.¹⁶⁰

This signaled an important shift in U.S. policy on nuclear test bans. After the United States completed its nuclear test plan, it was eager to push forward a global test ban treaty and wanted to get other major nuclear weapons states onboard. Senior research associates Thomas Cochran and Christopher Paine believed it was the right time to engage with their Chinese counterparts to discuss issues related to the global nuclear test ban.

¹⁵⁹Chen and Wang, "U.S. Visit Report: Technical Information Regarding Nuclear Arms Control, Monitoring, and Verification, March 23- April 5, 1996 (访美专题汇报----核军控、检测、核查技术方面信息 (1996年3月23日-4月5日))."

¹⁶⁰"Arms Control Association," "No Going Back: 20 Years since the Last U.S. Nuclear Test " *Arms Control Today* 3, no. 14 (2012).

On March 29, 1993, Cochran and Paine coauthored a letter to be delivered to Hu Side and Wang Deli at the Institute of Applied Physics and Computational Mathematics. They explained in this letter that the U.S. Congress had asked the president to start a test ban treaty negotiation. The United States would not conduct any more nuclear tests after September 30, 1996, unless other countries tested. In response to the congressional mandate, the new administration was preparing a comprehensive review of U.S. nuclear test policy and was at that moment making a new plan for U.S. nuclear tests in the future. Cochran and Paine believed that this was a critically important moment to have a discussion with Chinese nuclear scientists and nuclear policy makers because the prospects of a successful nuclear test ban treaty relied on full cooperation from China. They mentioned that the discussion did not need to be at the official level but would be very helpful if views could be exchanged informally at the unofficial level. If possible, they wanted to know the Chinese perspective on the U.S. nuclear test moratorium, the impact of a test ban treaty on China's nuclear weapon development plan, and the implications for China's nuclear policy if the United States, Russian, and France extended their nuclear moratoria.¹⁶¹

Wanting to have a better understanding of U.S. thinking on CTBT, Hu Side and Wang Deli responded positively to Cochran and Paine's proposal and decided to host a visit by the Natural Resources Defense Council to the Institute of Applied Physics and Computational Mathematics. On June 1, a six-member U.S. delegation arrived in Beijing and began a four-day exchange with Chinese nuclear experts. Besides Thomas Cochran and Christopher Paine, Robert Norris from NRDC, George Bunn from Standard

¹⁶¹Zhao, "Track Two Dialogue between the U.S. And China on Ctbt Negotiations (二轨外交与中美全面禁止核试验条约谈判)."

University, and Ray Kidder from LLNL (retired) all participated in this exchange. On the Chinese side, there were a total of 25 participants, most of whom were from CAEP and IAPCM, such as Hu Side, Du Xiangwan, Liu Gongliang, TianDongfeng, and Wang Deli. Experts from the China Defense, Science, and Technology Information Center, China Institutes of Contemporary International Relations, Chinese People's Association for Peace and Disarmament, and Beijing University of Aeronautics and Astronautics also took part in the meeting.

American and Chinese experts exchanged views about the status of nuclear weapons programs of the major nuclear weapons states. They agreed that there was no strong demand for new nuclear weapon designs in the United States and Russia, and both countries had no new research and development plans. Britain's nuclear weapon development was also restricted because it did not have its own nuclear test site and had been using the American test site at Nevada. France, too, had cancelled or postponed most of its nuclear development plans and had joined the United States, Britain, and Russia in nuclear test moratoria. China's decision, as a result, would be critical for what would happen in the near future. If China continued to test, this would give other nuclear weapons states an excuse for resuming their nuclear tests, too. Hu Side and other Chinese experts explained that it was China's policy to pursue the ultimate goal of comprehensive prohibition and complete elimination of nuclear weapons. They argued that China would be supportive of nuclear arms control efforts including the nuclear test ban, as those were in line with China's nuclear policy and strategic objectives.

American experts also briefed Chinese experts about domestic debates in the United States about nuclear test bans. That debate was centered on the safety, security, and

reliability of U.S. nuclear weapons and would significantly affect U.S. decisions on a comprehensive test ban. After the collapse of the Soviet Union, some in the United States argued that the priority of the U.S. nuclear program should shift from “modernizing” existing stockpiles to increasing its “safety” and “security.” As a result, they asserted that the United States needed to spend money on developing a new generation of nuclear warheads, as well as new aircrafts and other delivery systems that were safer and less prone to accidents. The U.S. Congress, on the other hand, was opposed to this new plan and believed it was unnecessary to develop “safer” and “more secure” nuclear warheads because there had never been an accidental nuclear explosion. Chinese scientists such as Liu Gongliang held the view that it was understandable for the United States to conduct a limited number of tests for the purpose of addressing safety and security issues. But China would be concerned about the ability of technologically advanced countries to circumvent CTBT detection systems. In the process of negotiating the CTBT, the more important issue was going to be the establishment of an effective verification regime through sufficient information exchange and technology sharing.

Among potential issues that might prevent countries from reaching agreement on CTBT, the definition of “nuclear test” received a lot of discussion. American scientists were very candid in saying that it was going to be difficult for nuclear weapons states and nonnuclear weapons states to reach agreement on the definition of nuclear explosion. On the one side, the nuclear weapons states wanted to keep a certain ambiguity regarding the definition of nuclear explosion so that they could continue making necessary experiments that would make it easier to effectively maintain their existing nuclear stockpiles. On the other side, all the nonnuclear weapons states would demand prohibiting any type of

nuclear explosion. As a result, American scientists suggested that it would be really helpful for the five nuclear weapons states defined by the NPT to reach an informal agreement among themselves in advance. That would make negotiations with the nonnuclear weapons states easier.

Aware of the significant problem of verification if countries all proposed their own desired thresholds for nuclear explosion, the Chinese scientists suggested that a strict definition of nuclear explosion be adopted (i.e., any nuclear explosion with a yield larger than zero should be prohibited). This zero-yield standard should be applied also to experiments that are intended to help maintain the efficacy and reliability of existing stockpiles.¹⁶²

In terms of CTBT verification, there was still debate about whether it was possible to reliably detect clandestine nuclear explosions with yields of less than 1 kiloton. Chinese scientists suggested that more joint research be conducted to better understand available verification technology and its policy implication. This position clearly reflected China's concern that its relative lack of verification experience and technology might land it in an unfavorable position during official negotiations. They therefore argued that relevant countries should also share their verification technology with each other in order to avoid a limited number of technologically advanced countries dominating the negotiations over the CTBT verification regime.¹⁶³

¹⁶²Zou, "China and the Ctbt Negotiations."

¹⁶³Zhongliang (吴忠良) Wu, "Nuclear Tests Monitoring Technology and Physics (核试验监测的技术和物理)," *Physics (物理)* 36, no. 07 (2007).

Indirect Communication

In addition to dialogues and exchanges, American scientists also provided their Chinese colleagues with in-depth research (unclassified research) conducted by the United States or U.S. experts to help the Chinese better understand the policy debates and development in the United States in the belief that if well informed, China would be more capable of making rational decisions over CTBT that were going to serve both countries' common interests.

In 1994, per the request of the U.S. government, an independent group of scientists—the Jason Committee—conducted research on the necessity for the United States to continue nuclear tests.¹⁶⁴ The chair of the Jason Committee, Sidney Drell, provided their report to Hu Side of the Institute of Applied Physics and Computational Mathematics. The Science and Technology Information Center of Chinese Academy of Engineering Physics then translated this report into Chinese.

The Jason report concludes that after more than 1,000 nuclear tests over more than fifty years—particularly after the most recent 150 tests of new nuclear weapon designs over the last twenty years—the United States could be highly confident that the safety, security, and reliability of its existing stockpile could be maintained over the next several decades.¹⁶⁵

When it comes to CTBT, the Jason report states that nuclear tests at a yield of about 500 kiloton are helpful for understanding the functioning of boost gas ignition and initial burn,

¹⁶⁴Sidney Drell et al., "Nuclear Testing: Summary and Conclusions, Jason Report Jsr-95-320," (August 3, 1995).

¹⁶⁵Ibid.

which is a critical step in achieving full primary design yield. However, such tests must be conducted regularly and be conducted each and every time after old parts are replaced with remanufactured parts. However, this would turn the CTBT essentially into another TTBT. Although such tests can add to confidence about long-term stockpile reliability, its importance is not going to be as high as the Science-Based Stockpile Stewardship program (SBSS).¹⁶⁶ Therefore, the overall benefit for conducting such tests is not significant.

The Jason report also finds that lower-yield nuclear tests were not necessary. Nuclear tests with nominal yields up to a 100-ton limit permit “examination of aspects of the pre-boost fission process.” However, “this is at best a partial and possibly misleading performance indicator.” As for the so-called hydro nuclear tests (tests with a nuclear yield of less than 4 lbs. TNT equivalent), the Jason report concludes that there is no persuasive case for the utility of hydro nuclear tests for detecting small changes in the performance margins for current U.S. weapons. At best, “such tests could confirm the safety of a device against producing detectable nuclear yield if its high explosive is detonated accidentally at one point.” However, “the U.S. arsenal has neither a present nor anticipated need for such re-confirmation.”¹⁶⁷

In case serious technical problems emerged that would significantly reduce the reliability of the U.S. nuclear stockpile and that could not be addressed by the SBSS, the United States might need to test the primary at full yield and to test the ignition of the secondary. The yield of such tests might exceed 10,000 kilotons. In this case, as suggested by the

¹⁶⁶C Callan et al., "Science Based Stockpile Stewardship," (Mitre Corp Mclean Va Jason Program Office, 1994).

¹⁶⁷Drell et al., "Nuclear Testing: Summary and Conclusions, Jason Report Jsr-95-320."

Jason Committee, the United States could choose to withdraw from the CTBT according to the “supreme national interests” withdrawal clause of the treaty.

In general, the Jason report concludes that because of the SBSS, there is no need for the United States to continue conducting low-yield nuclear tests, as they are not going to be particularly helpful. Partly because of the conclusion that the Jason report presented, President Clinton in August 1995 decided to support the zero-yield test ban proposal in the CTBT negotiation and expressed support for relying on the SBSS for maintaining the safety, security, and reliability of the U.S. nuclear stockpile after CTBT enters into force.¹⁶⁸

During the series of Track II exchanges shortly before and during the CTBT negotiations, Chinese nuclear scientists received several important unclassified research reports produced by their American colleagues or the U.S. government, including the Jason Committee report, the DOE’s Seven Years’ Plan of Technology Research and Development for the Monitoring and Verification of the Comprehensive Test Ban Treaty, the NRDC’s *Arsenals of the Nuclear Weapons Power: An Overview*,¹⁶⁹ among others. These reports received much attention and many of them were translated into Chinese and widely distributed within the nuclear laboratories.¹⁷⁰ By the time CTBT negotiations started, China’s nuclear maintenance capability was much less advanced than the United States, and China faced serious uncertainty about its capability to maintain its nuclear stockpile after nuclear tests were prohibited. Chinese scientists carefully studied these

¹⁶⁸“Comprehensive Test Ban Treaty Chronology,” Federation of American Scientists, <http://www.fas.org/nuke/control/ctbt/chron.htm>.

¹⁶⁹“The Arsenals of the Nuclear Weapons Power: An Overview,” (Natural Resources Defense Council, January 4, 1996).

¹⁷⁰Zhao, “Track Two Dialogue between the U.S. And China on Ctbt Negotiations (二轨外交与中美全面禁止核试验条约谈判).”

reports provided by the U.S. scientists and found them very helpful in drawing lessons from the U.S. SBSS program and the Accelerated Strategic Computing Initiative (ASCI). This has helped reduce Chinese scientists' concerns and build their confidence in maintaining China's stockpile under CTBT.¹⁷¹

Operational-Level Engagement and the Emergence of China's Nuclear Arms Control Community

The Defense Industry

Chinese nuclear scientists in the defense industry did not begin conducting arms control research until the late 1980s and early 1990s, when they became active participants in U.S.-Chinese operational-level engagement. During these exchanges, they came to the recognition that developing technical expertise in nuclear arms control treaty implementation is an important function of a country's nuclear weapon labs. They observed how the U.S. national labs devoted substantial resources to arms control and nonproliferation research and began to accept the notion that nuclear weapons scientists have a role to play in supporting their country's nuclear arms control and nonproliferation policy-making. As a result, many of the Chinese participants quickly set up research groups on arms control in their home institutes. China's nuclear scientists participated intensively in China's domestic discussion around CTBT and played an important role in official CTBT negotiations. Their influence grew quickly as a result.

China Academy of Engineering Physics (CAEP, 中国工程物理研究院)

¹⁷¹Ibid.

Hu Side was among the first group of Chinese nuclear scientists to participate in U.S.-Chinese technical engagement. In his historical visit to the three major DOE nuclear labs (LANL, LLNL, and SNL) in February 1994, he and five other Chinese nuclear scientists had extensive discussions with American nuclear scientists on technical dimensions of important international security issues, including nuclear arms control and nonproliferation. After coming back from this trip, he created the Program for Verification Technologies Studies in 1995 to investigate technical solutions to support nuclear arms control verification.¹⁷²

Chen Xueyin, one of Chinese leading nuclear weapons scientists, attended an international conference organized by the Italian Union of Scientists for Disarmament (USPID)¹⁷³ on a nuclear winter in 1985. Chen met other nuclear arms control scientists from the United States and Soviet Union during this meeting and was greatly inspired by the feeling that there was a common language with other scientists. After returning from this meeting, Chen recommended setting up a working group within CAEP/IAPCM for nuclear scientists to discuss and work on nuclear arms control. This working group later became the Program on Science and National Security Studies (PSNSS, 科学与国家安全研究项目) at the Institute of Applied Physics and Computational Mathematics (IAPCM) in 1989.

Institute of Applied Physics and Computational Mathematics

¹⁷²Hsu, "The Impact of Government Restructuring on Chinese Nuclear Arms Control and Nonproliferation Policymaking."

¹⁷³USPID (UnioneScienziati per ilDisarmo in Italian) is the Italian Union of Scientists for Disarmament, an association established in 1982 with the purpose of providing information about and analysis of arms control and disarmament. For more information, see <http://www.uspid.org/>

In 1989, the Program for Science and National Security Studies was established within the Institute of Applied Physics and Computational Mathematics (IAPCM, 北京应用物理与计算数学研究所)¹⁷⁴ as an arms control research unit. The main research focus was on science and technology issues related to national and international security and arms control. This research unit carried out two types of research: One was to study the impact of nuclear weapons and conduct research on nuclear policy in general. The other was to conduct technical research on nuclear disarmament.¹⁷⁵ For example, PSNSS studied China's nuclear strategy and challenges faced by China's arms control policy.¹⁷⁶ It also conducted technical research on detection of nuclear warheads and verification of nuclear materials.¹⁷⁷ PSNSS quickly became a very successful and important part of IAPCM's technical and policy research arm. Its personnel and research activities increased speedily over time. IAPCM scientists produced a range of studies on important arms control issues, many of which became textbooks for training China's emerging arms control expert

¹⁷⁴ Both CAEP and IAPCM were part of CONSIND until 1998. With a government organizational restructuring in 1998, CAEP and IAPCM becomes subordinate organizations under the newly established General Armament Department of the PLA.

¹⁷⁵ Xiangli (孙向丽) Sun and Deli (王德礼) Wang, "Current Status and Future Trend of Nuclear Arms Control Research (核军备控制研究的现状与前景)," *Trends in Nuclear Physics (核物理动态)* 12, no. 4 (1995).

¹⁷⁶ Xiangli (孙向丽) Sun, "Features and Characteristics of China's Nuclear Strategy (中国核战略性质与特点分析)," *World Economics and Politics (世界经济与政治)*, no. 9 (2006); "New Challenges and New Agenda for China's Arms Control (中国军控的新挑战与新议程)," *Foreign Affairs Review (外交评论)*, no. 3 (2010).

¹⁷⁷ Bo (陈波) Chen and Fanhua (郝樊华) Hao, "Γ Detection of Nuclear Warhead Model (核弹头模型的Γ射线探测)," *Nuclear Electronics & Detection Technology (核电子学与探测技术)* 16, no. 6 (1996); Jian (龚建) Gong and Bo (陈波) Chen, "Detection and Identification of Nuclear Materials (核材料的探测和识别)," *ibid.* 15 (1995).

community.¹⁷⁸ Several years later, IAPCM set up an Arms Control Physics Division with a research staff of eight in January 1997.¹⁷⁹

The China Defense, Science, and Technology Information Center (CDSTIC)

Liu Huaqiu, a senior research fellow at the China Defense, Science, and Technology Information Center, was assigned to China's delegation to the Conference on Disarmament in the 1980s where he observed discussions at the CD on arms control issues and began to devote his research interests to arms control and disarmament.¹⁸⁰ In 1986, he established the first arms control and disarmament program within CDSTIC.¹⁸¹ This program later developed into the Department of Arms Control and Disarmament at CDSTIC.¹⁸²

Ministry of Foreign Affairs

After China re-obtained its membership in the United Nations in the 1970s and began to adjust itself to the post-Mao policy of opening up to the outside, it began to send delegations to important international organizations in an effort to participate more actively in international institutions. China sent its first observer team to the Conference on Disarmament in 1979 and joined the CD one year later. As soon as the Chinese delegates began to expose themselves to the CD discussions, they quickly recognized that

¹⁷⁸Deli (王德礼) Wang and Xiangli (孙向丽) Sun, "A Collection of Arms Control Research Papers (军备控制论文集)," (Beijing: Institute of Applied Physics and Computational Mathematics (应用物理与计算数学研究所), 1995).

¹⁷⁹Hsu, "The Impact of Government Restructuring on Chinese Nuclear Arms Control and Nonproliferation Policymaking."

¹⁸⁰Lora Saalman, "How Chinese Analysts View Arms Control, Disarmament, and Nuclear Deterrence after the Cold War," *Engaging China and Russia on Nuclear Disarmament. Monterey Institute of International Studies: James Martin Center for Nonproliferation Studies* (2009).

¹⁸¹Medeiros, *Reluctant Restraint: The Evolution of China's Nonproliferation Policies and Practices, 1980-2004*.

¹⁸²"The China Defense, Science, and Technology Information Center (Cdstic)," <http://www.cdstic.cn/>.

their lack of expertise was creating difficulties for them to effectively engage in discussions.¹⁸³ To address this, the Ministry of Foreign Affairs set up a new division within the Department of International Organizations to focus on arms control-related issues. This new division was designated as the Fourth Division and quickly became an effective training ground of China's first generation of arms control experts within the Ministry of Foreign Affairs. As members of China's delegation to the CD rotate from year to year, the number of Chinese Foreign Ministry officers who have worked at the CD and have obtained a substantial level of expertise on arms control has grown dramatically. By 1996, the year when the CTBT negotiations concluded at the CD, more than ninety Chinese foreign affairs officers had worked at the CD, compared to only a dozen in the early 1980s.¹⁸⁴

The PLA

Within the PLA, arms control-related issues have been primarily dealt with by the Second Department of the General Staff Department (总参二部). The Second Department is in charge of military intelligence. As the most important source of defense intelligence, national security, and military-related strategic analysis for China's senior leadership, the Second Department has superior resources and authority over other civilian and military intelligence agencies. Although the Second Department was established as early as the 1950s, it did not pay much attention to arms control issues except simply monitoring

¹⁸³ Alastair I Johnston, *Social States: China in International Institutions, 1980-2000* (Princeton University Press, 2008).

¹⁸⁴ Ibid.

arms control policies of the major powers.¹⁸⁵ Until the mid-1990s, the majority view within the PLA was that arms control was a game between superpowers and had little to do with China's security policy and paid minimal attention to arms control research as a result.¹⁸⁶ This was changed after some leading researchers within the PLA began to interact with the international arms control community starting from the late 1980s.

Pan Zhenqiang, who later became a major general, served in the General Staff Department of the PLA until 1986. In 1986, he began to work at the Institute of Strategic Studies (ISS) of the National Defense University (NDU) until his retirement in August 2001. At the ISS, he started as a research fellow and rose all the way to serve as the director of the institute. Soon after he became a research fellow at ISS, he was accepted into U.S. National Defense University in 1987 and later spent one year as a research fellow at the Center for International Security and Arms Control (later renamed the Center for International Security and Cooperation) at Stanford University during 1988–89. In the early to mid-1980s, he also served on China's delegation to the Conference on Disarmament for one year. Drawing on these experiences, his research interests began to shift to arms control and disarmament issues. As he assumed leadership positions within ISS, arms control and disarmament gradually became an important part of ISS's research portfolio. General Pan and his colleagues wrote and published one of the first books on arms control in China: *International Disarmament and Arms Control* (国际裁军与军备

¹⁸⁵ Michael D Swaine, *The Role of the Chinese Military in National Security Policymaking*, vol. 781 (Rand Corporation, 1998).

¹⁸⁶ Medeiros, *Reluctant Restraint: The Evolution of China's Nonproliferation Policies and Practices, 1980-2004*; Liu, "On the Characters of the Struggle of International Arms Control (论国际军控斗争的性质)."

控制),¹⁸⁷ in which he argues that arms control research is of high importance to the PLA and China's national security interests in general. Against the traditional view that arms control has nothing to do with China, General Pan and his team were the first within the system to challenge that view and point out that international arms control affects China's security interests and China should pay more attention to arms control issues. As more PLA researchers began to take up arms control issues, they ultimately played an important role in changing the traditional view within the military.¹⁸⁸ The Institute of Strategic Studies of the National Defense University also became the leading arms control policy research institute with the PLA.

Research Institutes

Fudan University

The establishment of China's first non-government-based arms control research program—the Program on Arms Control and Regional Security at the Center for American Studies of Fudan University—was also greatly influenced by U.S.-Chinese operational-level engagement. The founder of this program is Dr. Shen Dingli, who received his PhD in physics in 1988 and was then accepted into the arms control program at Princeton University. His interaction with arms control experts and scientists at Princeton during 1989–1991 shifted his research from physics to the interdisciplinary area of science and international security. His initial research focused on China's nuclear

¹⁸⁷ Zhenqiang (潘振强) Pan, Liping (夏立平) Xia, and Zhongchun (王仲春) Wang, eds., *International Disarmament and Arms Control (国际裁军与军备控制)* (Beijing: National Defense University Press, 1996).

¹⁸⁸ Bo (许博) Xu, "Arms Control and Sino-U.S. Relations after the Cold War (冷战后军备控制与中美关系)" (The PLA University of Foreign Languages (中国人民解放军外国语学院), 2004).

test policy and nuclear forces modernization.¹⁸⁹ Soon after returning from Princeton to Fudan University in 1991, Dr. Shen established the Program on Arms Control and Regional Security at the Center for American Studies.¹⁹⁰

Dr. Shen was also invited in 1991 to participate in an annual International Summer Symposium on Science and World Affairs organized by the Union of Concerned Scientists (UCS). UCS is a nongovernmental organization based in Boston that conducts scientific and technical research on important policy issues. The main goal of the annual International Summer Symposiums on Science and World Affairs is to encourage and support the development of young scientists working on policy-oriented research on international security and arms control issues. According to UCS, the Summer Symposium is to encourage the development of “independent, technically-trained arms control and international security analysts” in “countries where there is not a strong tradition of public interest science and to integrate them into the international community of researchers with similar interests and backgrounds.”¹⁹¹ Although the Summer Symposium was primarily intended at the beginning to enhance discussions between U.S. and Soviet junior scientists, the UCS also invited a small number of Chinese young scientists to participate. Dr. Shen therefore was invited to attend the third Summer Symposium in August 1991.

¹⁸⁹Dingli (沈丁立) Shen, "The Current Status of Chinese Nuclear Forces and Nuclear Policies," in *CEES Report No. 247*(Center for Energy and Environmental Studies); "Likely Impact of the Policy of Clinton Administration on China's Nuclear Test (克林顿政府对中国核试验可能产生的影响)," *Fudan Journal(Social Sciences Edition)* (复旦学报(社会科学版)), no. 04 (1993).

¹⁹⁰"Shen Dingli," Center for American Studies, Fudan University, <http://www.cas.fudan.edu.cn/viewprofile.en.php?id=66>.

¹⁹¹"25th International Summer Symposium on Science and World Affairs," Union of Concerned Scientists <http://www.summersymposium.org/>.

His experience apparently greatly inspired his interest in arms control-related research and was convinced about the importance of conducting international scientific dialogues. He offered to host the next Summer Symposium at his home university—Fudan University—in 1992. The 1992 Shanghai Summer Symposium became the first Summer Symposium ever held in China. It turned out to be very successful in bringing together an emerging generation of Chinese public interest scientists and in introducing them to the new field of arms control research and to their international colleagues. The Program on Arms Control and Regional Security also developed into a leading Chinese research institute on arms control and nonproliferation.¹⁹²

Operational-Level Engagement and the Growth of China's Nuclear Arms Control Community

Operational-level engagement not only helped China's nuclear arms control community to emerge but also played a significant role in facilitating its growth. As China's first generation of arms control specialists began to concentrate their own work on arms control, their appreciation of the importance of international engagement encouraged them to start promoting more dialogues and exchanges between their home institutes and the international arms control communities. The emergence and increase of dialogues and exchanges provided unprecedented opportunities to expose a growing number of Chinese experts to arms control issues.

¹⁹²"Shen Dingli."

Dialogues, Exchanges, and Growth of the Chinese Community

Hu Side, a frequent participant of U.S.-Chinese nuclear scientific dialogues, founded the ISODARCO-Beijing Seminar on Arms Control in 1988. This ISODARCO-Beijing Seminar takes place on a biennial basis and is organized by the IAPCM and CICIR. It was initiated by the Chinese military nuclear establishment to serve as a communication channel between Chinese and the international scientific community. The Italian International School on Disarmament and Research on Conflicts (ISODARCO) serves as the main foreign partner of this dialogue,¹⁹³ but American arms control experts have been the most important foreign participants. After the ISODARCO-Beijing Seminar was established, CTBT-related issues quickly became a major focus. This seminar offers a timely opportunity for Chinese arms control and international security experts to present their research on CTBT and have discussion with their colleagues from the United States and other countries.¹⁹⁴

¹⁹³ For more information about ISODARCO and a chronicle of the seminars organized by ISODARCO, see <http://www.isodarco.it/index.html>

¹⁹⁴ Xueze (胡学泽) Hu, "The Second Beijing Arms Control Seminar: Introduction and Paper Titles (北京第二届军备控制讨论会简况及论文题目介绍)," *International Data and Information (国际资料信息)*, no. 9 (1990).

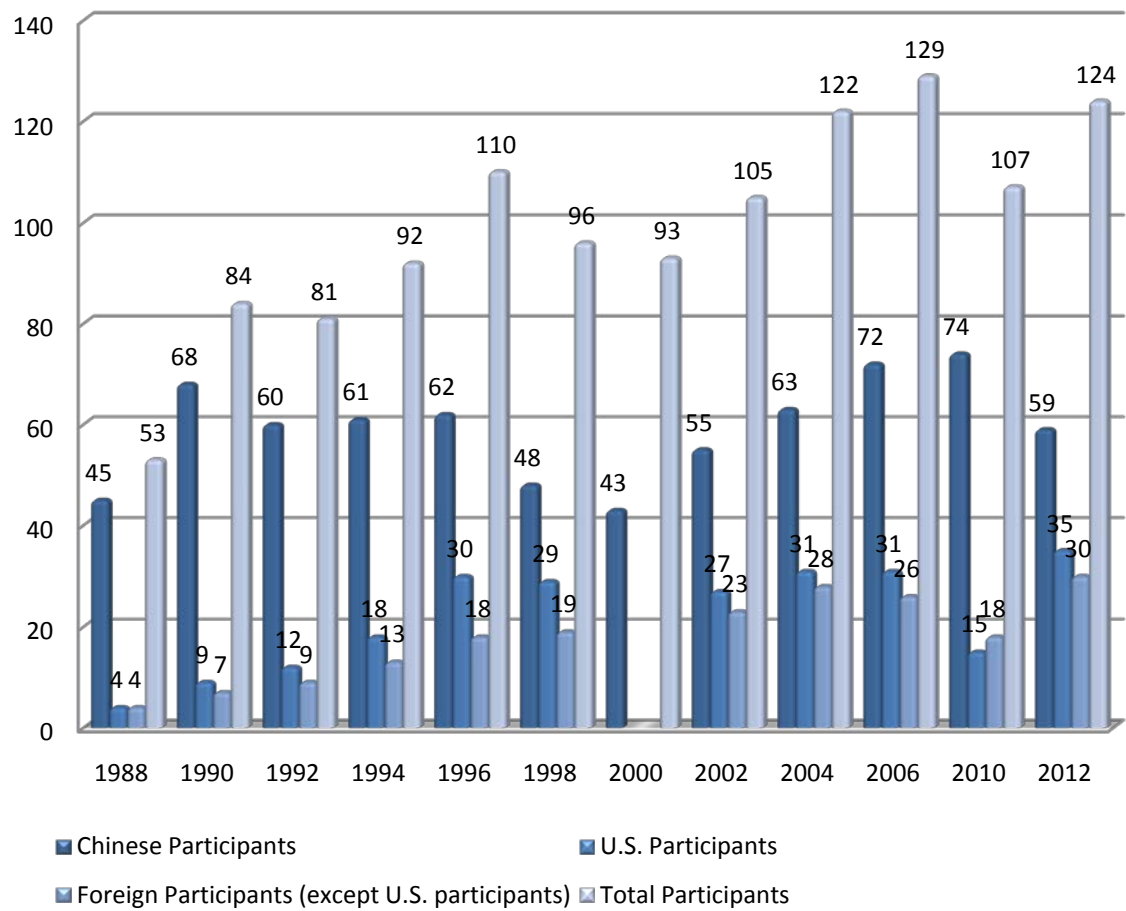


Figure 1 Participants in ISODARCO-Beijing Seminar on Arms Control, 1988–2012¹⁹⁵

¹⁹⁵ Data collected from the official participant lists for each ISODARCO-Beijing Seminar. Date for 2008 and some of the date for 2000 is not available.

Table 4 Chinese and Foreign Participants in ISODARCO-Beijing Seminar on Arms Control, 1988–2012¹⁹⁶

Year	Chinese Participants	U.S. Participants	Foreign Participants	Foreign Participants (except U.S. participants)	Percentage of U.S. Participants in Total Foreign Participants	Total Participants
1988	45	4	8	4	50%	53
1990	68	9	16	7	56%	84
1992	60	12	21	9	57%	81
1994	61	18	31	13	58%	92
1996	62	30	48	18	63%	110
1998	48	29	48	19	60%	96
2000	43	n.a.	50	n.a.	n.a.	93
2002	55	27	50	23	54%	105
2004	63	31	59	28	53%	122
2006	72	31	57	26	54%	129
2010	74	15	33	18	45%	107
2012	59	35	65	30	54%	124

¹⁹⁶ Data collected from the official participant lists for each ISODARCO-Beijing Seminar.

As shown in Figure 1 and Table 4, a large number of Chinese participants attended each of the ISODARCO-Beijing Seminars on Arms Control since 1988. Taking into consideration the fact that China's arms control community was still very young and small in the late 1980s and early 1990s, the gathering and presence of a large number of Chinese experts in this arms control seminar is by itself a strong indicator of a rapid growth of interest. The number of foreign participants also increased dramatically from eight in 1988 to 65 in 2012. American arms control experts have been most active in these meetings. More than half of the foreign participants are from the United States. A breakdown study of the official participant lists shows more details:

1. The seminar not only invited senior Chinese experts but was also open to young and next-generation Chinese analysts. In each seminar since 1988 till 2012, there were about twenty to thirty new Chinese participants who had never attended this seminar before. On an accumulative base, therefore, a total of several hundreds of Chinese experts have participated in one or more seminars;
2. An increasing number of Chinese government agencies and non-government research institutes are represented on these seminars. At the beginning Chinese participants were primarily from the military nuclear complex – the CAEP, IAPCM, and CDSTIC. Increasingly, officials from the Ministry of Foreign Affairs and the Ministry of Defense began to attend the meetings. Experts from major research institutes such as CICIR and CIIS and major universities such as Fudan University, Tsinghua University, and Beijing University were also involved. Since the late 1990s through the 2000s, Chinese participants came from

an increasingly diversified background and institutes. Even government agencies that are partially involved in arms control policy-making sent experts to these seminars. Experts from a large number of research institutes became interested in arms control issues and got involved in this dialogue. Figure 2 is the list of Chinese institutes and organizations that sent representatives to the 2012 ISODARCO-Beijing Seminar. They include all the major government agencies, PLA organizations, defense industry entities, research institutes, think tanks, universities, and non-governmental organizations. The ISODARCO-Beijing Seminars have greatly helped the expansion and pluralization of China's arms control community.

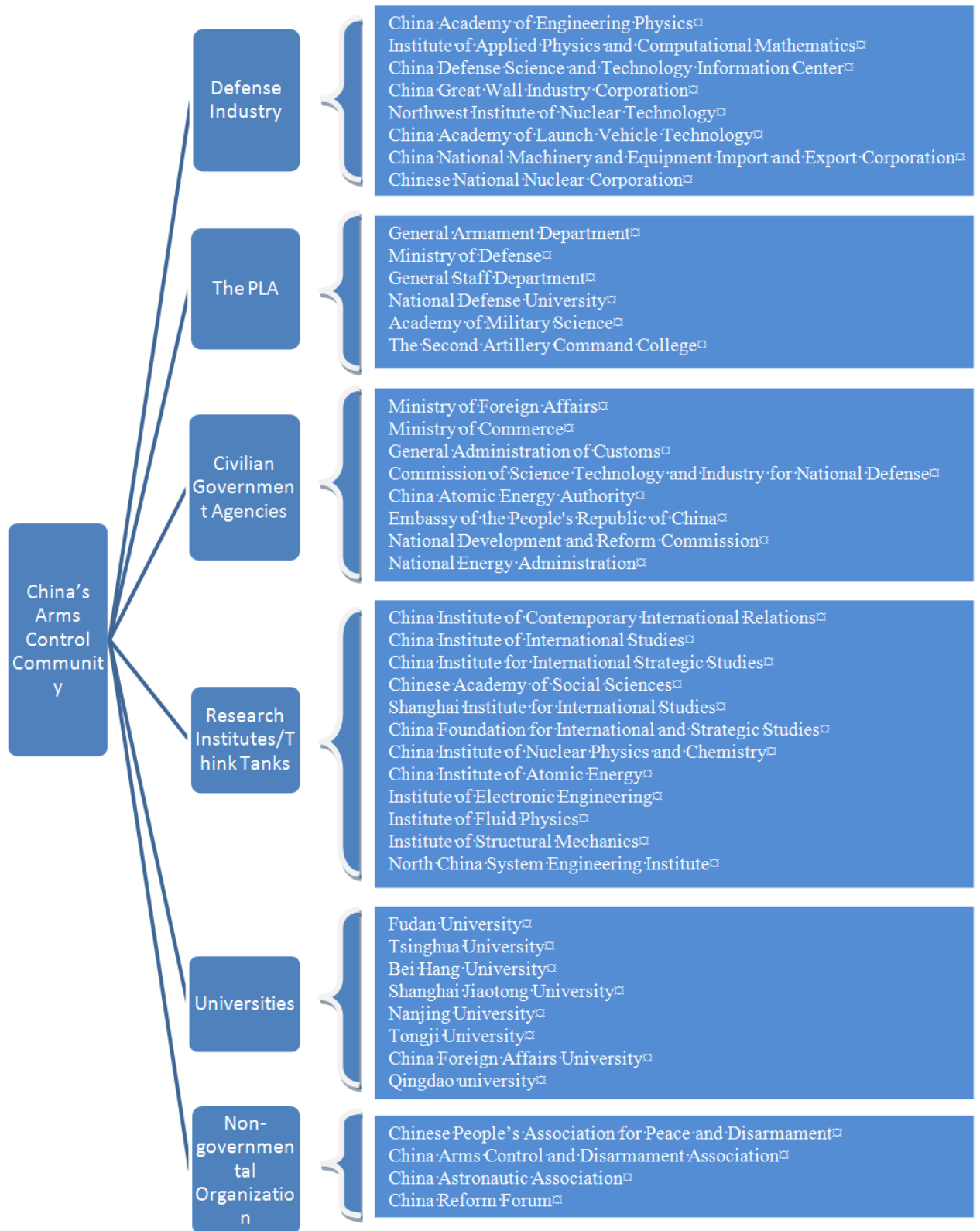


Figure 2 Expansion and Pluralization of China's Arms Control Community as Represented in ISODARCO-Beijing Seminars on Arms Control (2012)

Training Programs and the Growth of the Chinese Community

After setting up the Program on Science and National Security Studies in 1989, CAEP and IAPCM started graduate programs in the multidisciplinary area of science and arms control including both MA and PhD programs in 1990.¹⁹⁷ Du Xiangwan (杜祥琬), a leading Chinese nuclear weapons scientist and a frequent participant of U.S.-China exchange programs, wrote and published the book *The Scientific and Technological Foundation of Nuclear Arms Control* (核军备控制的科学技术基础), which later became a popular textbook that was widely used in arms control education programs across the country. The graduate programs at CAEP and IAPCM have been very effective in cultivating China's new generation of arms control specialists.

Li Bin, one of China's leading nuclear arms control experts since the 1990s, is one of the graduates of the CAEP/IAPCM program. After receiving his bachelor's and master's degrees in physics in 1988, Li entered the Graduate School of CAEP to study arms control. During that time, his research focus was on the technical aspects of controlling laser weapons for missile defense. He received his PhD in 1993 and continued to work for IAPCM as a research fellow. He began to focus his research on the CTBT. He also joined the COSTIND technical group that supported the Chinese CTBT Negotiating Team in Geneva. One year later, in 1994, Dr. Li received the two-year postdoctoral Fellowship on Peace and Security in a Changing World awarded by the Social Science

¹⁹⁷Xiangwan (杜祥琬) Du, *The Scientific and Technological Foundation of Nuclear Arms Control* (核军备控制的科学技术基础)(Beijing: Defense Industry Press (国防工业出版社), 1996).

Research Council and MacArthur Foundation. Under the support of this fellowship, he spent his first year at the Defense and Arms Control Studies Program (now the Security Studies Program) at the Massachusetts Institute of Technology (MIT) to undergo training in the field of arms control and international security. He spent his second year at the Center for Energy and Environmental Studies at Princeton University, where he continued his research on CTBT, missile proliferation, and missile defense.

After Dr. Li went back to IAPCM in the summer of 1996, he was appointed senior research fellow. In late July 1996, when the last round of CTBT negotiations began, he was sent to CD in Geneva to serve as a technical adviser to the Chinese CTBT Negotiating Team. After the conclusion of the CTBT, Dr. Li went back to IAPCM and set up a division in IAPCM to study the technical aspects of arms control. He was appointed director of this division, as well as executive deputy director of the Program for Science and National Security Studies.¹⁹⁸

After leaving IAPCM, Dr. Li set up a research center—the Institute of Science and Public Affairs at China Youth College for Political Science in 1999—and another research center—the Arms Control Program at the Institute of International Studies (now the Department of International Relations) of Tsinghua University in 2000. Since then, the Arms Control Program at Tsinghua University has served as one of the most important and influential training programs for China's young arms control specialists.

Like Dr. Shen Dingli, Dr. Li Bin was also an early participant of UCS's International Summer Symposium on Science and World Affairs. After the first summer symposium

¹⁹⁸"Li Bin," Nautilus Institute for Security and Sustainability,
<http://oldsite.nautilus.org/archives/nukepolicy/workshops/shanghai-01/LiBin.html>.

was held in China in 1993, Chinese participants in this program grew more supportive of it and soon organized another summer symposium in China. The 1996 summer symposium was therefore held in Beijing and hosted by the Beijing University of Aeronautics and Astronautics (also known as Bei Hang University). This meeting again played the important function of helping to create a community of Chinese researchers, “most of whom were unaware of others working on similar issues” at that time.¹⁹⁹

Under the leadership of Dr. Shen Dingli, the Program on Arms Control and Regional Security at the Center for American Studies of Fudan University also became China’s first university-based arms control training program and began to offer classes on nuclear arms control and nonproliferation as part of their master’s and PhD curriculum since the early 1990s.

In summary, Figure 3 illustrates the dramatic increase of Chinese organizations that became part of China’s nuclear arms control community, due to a large part to the intensive operational-level engagement between the United States and China before and during the CTBT negotiations. In Figure 2, boxes with blue borders are civilian organizations under the administration of the State Council; boxes with red borders are organizations within the defense industry; and boxes with green borders are military organizations. The Central Military Commission was in charge of both the military and the defense industry at that time. In this figure, only organizations that are filled with white color were involved – to a very limited extent – in China’s arms control policy-making and policy discussion before intensive operational-level engagement took place

¹⁹⁹ Personal correspondence with experts at Union of Concerned Scientists, 2008. “25th International Summer Symposium on Science and World Affairs.”

between the United States and China around CTBT. Those organizations that are filled with grey color are new organizations that became part of China's nuclear arms control community by the time that U.S.-China engagement on CTBT ended in late 1996.

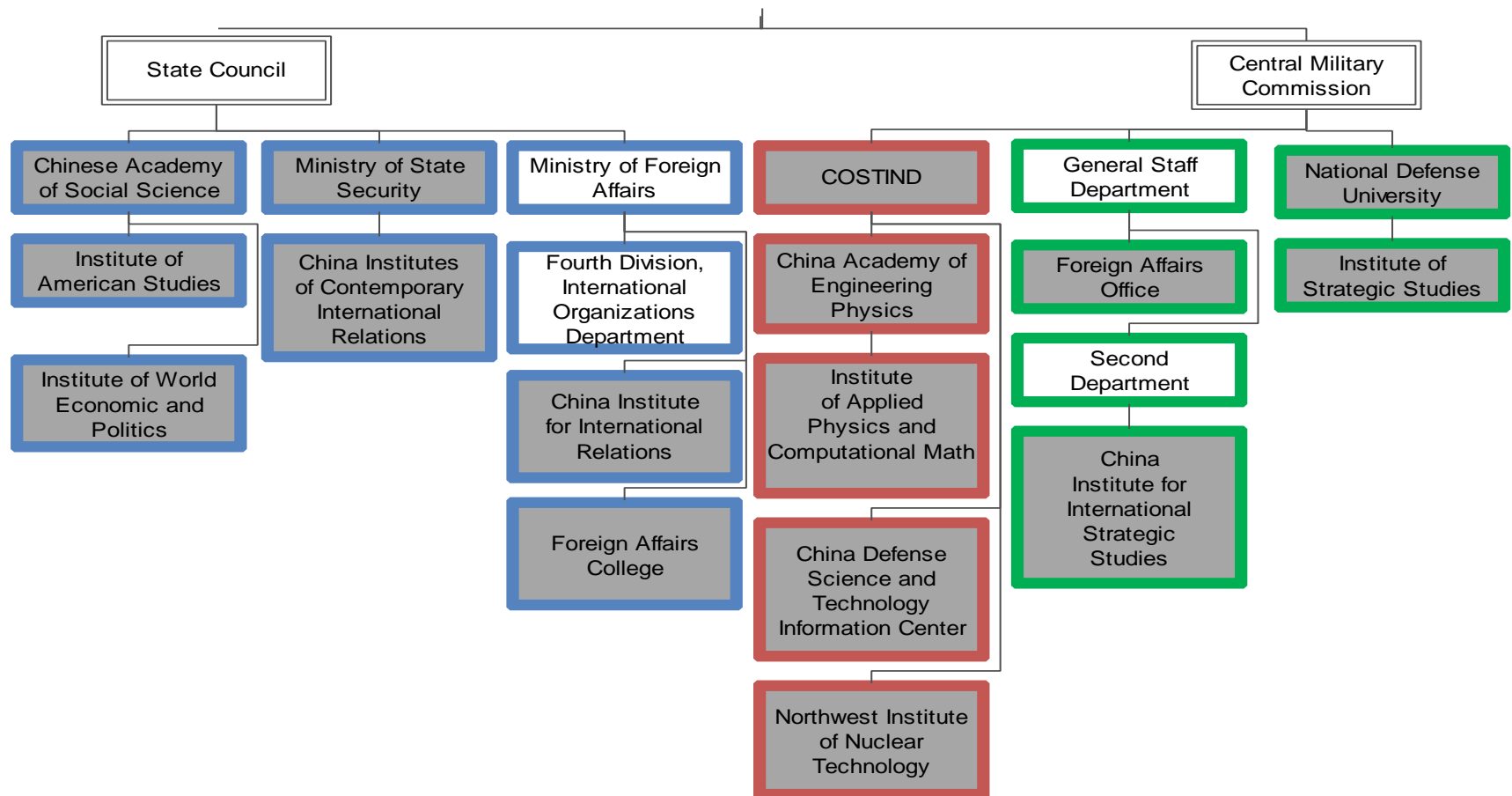


Figure 3 China's Nuclear Arms Control Organization Chart, by the end of CTBT negotiation

Inter-Agency Coordination and Communication Channels

Before the bilateral engagement around CTBT, there was clearly a lack of a formal decision-making mechanism for specific arms control issues. The overall arms control community was disjointed and lacking cohesiveness. The historical development of the compartmentalized nuclear establishment contributed to the stovepipe nature of Chinese organizations.²⁰⁰ There were only very limited interactions between China's nuclear weapons scientists and members of China's nascent arms control policy community.²⁰¹ China's defense industry organizations, for example, were tightly vertically integrated but highly autonomous from other organizations outside the defense industry. The scope and frequency of interagency exchange, communication, and coordination increased significantly during and after the CTBT engagement and negotiations.

Coordination Mechanism within and among the Defense Industry, the Foreign Ministry, and Academics

Starting in 1992, COSTIND's Science and Technology Committee (科技委) held an annual meeting on international arms control developments. The Science and Technology Committee was in a very senior and powerful position within the defense industry. It is described as "the leading technical and intellectual brain trust for supporting the planning and development of defense S&T."²⁰² Due to the seniority of its members, the Science

²⁰⁰Hsu, "The Impact of Government Restructuring on Chinese Nuclear Arms Control and Nonproliferation Policymaking."

²⁰¹Medeiros, *Reluctant Restraint: The Evolution of China's Nonproliferation Policies and Practices, 1980-2004*.

²⁰²Eric Hagt, "China's Defense High-Tech Leadership: Implications for S&T Innovation," in *Policy Brief No. 22*(San Diego: The Study of Innovation and Technology in China (SITC), University of California Institute on Global Conflict and Cooperation, 2011).

and Technology Committee and its annual conference on arms control had important influence within China's internal arms control policy debates.

COSTIND established the Senior Arms Control Leading Group in early 1990s, which was supervised by COSTIND's Arms Control Office. General Qian Shaojun, a former commander of the Lop Nur nuclear test site, was the director of the Arms Control Office.²⁰³ The main responsibility of the Senior Arms Control Leading Group was to coordinate arms control and nonproliferation research and policy analysis within the entire Chinese defense industry. The group was in charge of allocating money and organizing research, aligning the activities of the defense industry with China's international arms control and nonproliferation commitment, and providing policy advice to relevant government agencies.²⁰⁴

In order to coordinate broader interaction among the larger arms control community in China, COSTIND established the Arms Control Experts Group (军控专业组), which pulled together and conducted regular interaction (every month or every other month) among China's top researchers on arms control from all the major research institutes including CDSTIC, CAEP, IAPCM, CIIS, CIISS, IAS, etc.²⁰⁵ The PSNSS program at CAEP/IAPCM also organized a seminar series that brought together experts from a range of agencies including the PLA General Staff Department, Ministry of Foreign Affairs, and the technical community to discuss policy and technical issues related to nuclear arms control. This had greatly facilitated the interagency community among China's

²⁰³ Hsu, "The Impact of Government Restructuring on Chinese Nuclear Arms Control and Nonproliferation Policymaking."

²⁰⁴ Medeiros, *Reluctant Restraint: The Evolution of China's Nonproliferation Policies and Practices, 1980-2004*.

²⁰⁵ Ibid.

burgeoning arms control community.²⁰⁶ In response to increasing CTBT and other nuclear arms control discussions in the 1990s, MFA began to hold monthly preliminary meetings (务虚会) to review and discuss new developments in international arms control. Usually thirty to forty participants from across China's arms control community came to such meetings and contributed thoughts on how China should adjust its arms control policy.²⁰⁷

Soon after the onset of CTBT negotiations, MFA was finally given permission to upgrade the Fourth Division within the International Organizations Department into the new and separate Department of Arms Control and Disarmament. There was probably a sense that one agency had to be able to consistently take the lead within the entire government bureaucracy in coordination. The creation of the new department meant the MFA acquired more authority in the interagency process. ShaZukang, MFA's chief arms control official, used to be the head of the Fourth Division and a deputy director of the International Organization Department. After the creation of the new department, he was elevated to first director. This put him on roughly the same level, in terms of bureaucratic ranking, with QiaoShaojun who was the director of COSTIND's Arms Control Office and in charge of arms control issues within the entire Chinese defense industry. This bureaucratic elevation raised Sha's relative position in the interagency coordination process.

²⁰⁶ Johnston, *Social States: China in International Institutions, 1980-2000*.

²⁰⁷ Alastair Iain Johnston, "Learning Versus Adaptation: Explaining Change in Chinese Arms Control Policy in the 1980s and 1990s," *The China Journal* (1996).

Chinese Delegation to the Conference on Disarmament

A number of government agencies rotated members to serve on the Chinese delegation to the CD. Particularly during the CD negotiations on CTBT, all China's relevant government agencies sent representatives to the Chinese delegation to support China's CTBT negotiations. This became an important interagency communication and coordination mechanism for China's still young and growing arms control community. These government agencies are summarized in Table 5.

Table 5 Government Agencies Represented at the Chinese Delegation to the CD

Specific Unit	Unit Functions	Government Agency
The Fourth Division (四处), Department of International Organizations (国际司)	Arms control and disarmament policy	Ministry of Foreign Affairs
China Defense, Science, and Technology Information Center (CDSTIC)²⁰⁸	Information collection and research on foreign weapon systems, military technology, arms control, and other defense policy	Commission of Science, Technology, and Industry for National Defense (COSTIND)
CAEP/IAPCM	Nuclear weapons design, manufacture, and maintenance; nuclear arms control and nonproliferation policy research	COSTIND
Second Department	Intelligence collection and analysis	General Staff Department, the PLA

²⁰⁸Medeiros, *Reluctant Restraint: The Evolution of China's Nonproliferation Policies and Practices, 1980-2004*.

More importantly, before each CD meeting, there were usually internal preparatory meetings held in China for participants from the MFA, the military, and COSTIND to come together and communicate with each other on policy issues that were going to be discussed in Geneva.²⁰⁹

Nationwide Cross-Agency Meetings

For the purpose of promoting intellectual exchange, some large-scale meetings were occasionally held to bring together a large number of experts from various agencies. In October 1986, for example, CICIR, MFA, and BIISS (Beijing Institute of International Strategic Studies) together organized a large-scale conference on arms control policy. More than fifty experts and analysts from almost all the major institutions, including CIIS, CASS, NDU, CICIR, CDSTIC, MFA, and BIISS, participated in the meeting.²¹⁰ Papers presented at the meeting were later published in the form of an internally circulated book under the title *A Collection of Research Papers on International Disarmament Struggle and China*.²¹¹ There was a general consensus in this meeting that China's arms control policy had been too simplistic, abstract, and inflexible and that there should be more horizontal connection and coordination within the entire community.²¹²

Table 6 summarizes China's internal interagency policy coordination channels that had been established by the end of the CTBT negotiations.

²⁰⁹Ibid.

²¹⁰Bonnie S Glaser and Banning N Garrett, "Chinese Perspectives on the Strategic Defense Initiative," *Problems of Communism* 35, no. 2 (1986).

²¹¹"A Collection of Research Papers on International Disarmament Struggle and China (国际裁军斗争与中国: 论文集)," (Beijing: China Institutes of Contemporary International Relations (现代国际关系研究所), 1987); *ibid.*

²¹²*Ibid.*

Table 6 Interagency Coordination Channels, 1996

Title	Hosting Agency	Participating Agency	Coordinating Manner
Chinese Scientists Group on Arms Control (CSGAC)	Chinese People's Association for Peace and Disarmament	Nuclear defense industry, the PLA	Internal preparatory meetings before the annual dialogue with U.S. National Academy of Sciences
Science and Technology Committee Annual Conference	COSTIND	Nuclear defense industry, the PLA, academics, research institutes, Ministry of Foreign Affairs	Annual conference on arms control
Senior Arms Control Leading Group	COSTIND	All relevant entities within China's defense industry	Allocating money and organizing research, aligning the activities of the defense industry with China's international arms control and nonproliferation commitment, and providing policy advice to relevant government agencies
Arms Control Experts Group	COSTIND	China's main research institutes including CDSTIC, CAEP, IAPCM, CIIS, CIISS, IAS	Monthly meeting on arms control
PSNSS Seminar Series	CAEP/IAPCM	PLA General Staff Department, Ministry of Foreign Affairs, the nuclear defense industry	Arms control seminar series
MFA Preliminary Meeting	Ministry of Foreign Affairs	Academics, research institutes, the nuclear defense industry, the PLA	Monthly preliminary meetings
Arms Control Research Group Annual Meeting	Ministry of Aerospace Industry	Academics, the defense industry, research institutes	Annual ten-day meeting ²¹³

²¹³Medeiros, *Reluctant Restraint: The Evolution of China's Nonproliferation Policies and Practices, 1980-2004*.

Bottom-Up Channel of Communication and Influence

Initiation of Internal Policy Discussion by China's Nuclear Scientists

China's original official position was strong objection to CTBT. China's position was that banning nuclear testing by itself was useless unless it was accompanied by a general program for disarmament. After China began to participate in the CD in 1980, it blocked efforts even to set up an *ad hoc* working group to discuss the nuclear test ban for five consecutive years. In August 1981, China submitted a working paper to the CD to explain its position about the nuclear test ban. It stated, "Prohibiting nuclear tests can not bring about nuclear disarmament by itself. Nuclear threats can only be reduced when a range of measures for nuclear disarmament are taken."²¹⁴

Chinese nuclear scientists, who had been following the progress of U.S. and Soviet nuclear weapons development, came to the conclusion that the United States would soon come to the point where it had mastered all the important technologies and additional tests would bring about reduced marginal benefits. Deng Jiaxian, Yumin, and Hu Side—all prominent nuclear weapons scientists—wrote a report to the Central Committee of the Chinese Communist Party proposing that China prepare for a possible global nuclear test ban in the near future. They recommended that China accelerate its nuclear testing program and finish the tests of its miniaturized warhead design in advance of a test

²¹⁴"Views on Disarmament and Related Issues, Working Paper," in *Conference on Disarmament*(Geneva: CD/206, August 6 1981).

ban.²¹⁵ Their proposal received considerable high-level attention and the Central Committee approved their report on April 2, 1986.²¹⁶

At the same time, China's official position on CTBT began to soften. China had stopped nuclear testing in the atmosphere as early as October 1980, but in 1986 China for the first time officially announced that it would conduct no more atmospheric nuclear tests.²¹⁷

Also in 1986, the Chinese delegation at the CD for the first time expressed its willingness to participate in an *ad hoc* committee on CTBT if such a committee were convened.²¹⁸

Arms Control Community and Their Bureaucratic Connections

Some of the major Chinese research institutes that conducted research on the nuclear test ban and contributed to government policy deliberation included the China Institute of Contemporary International Relations (CICIR, 现代国际关系研究所), China Institute of International Studies (CIIS, 中国国际问题研究所), Foreign Affairs College (外交学院), and Chinese Academy of Social Science (CASS, 中国社会科学院). Within CASS, the Institute of American Studies (IAS, 美国研究所) and the Institute of World Economic and Politics (世界经济政治研究所) played the important role in conducting arms control research.

²¹⁵ Jian (宋健) Song and Nengquan (葛能全) Ge, *Biography of the Founding Fathers of China's Atomic Bomb, Ballistic Missile, and Satellite Project* ("两弹一星" 元勋传), vol. 1 (Beijing: Tsinghua University Press (清华大学出版社), 2001).

²¹⁶ Ibid.

²¹⁷ Guangya (朱光亚) Zhu, "A Few Reflective Thoughts on China's Nuclear Tests (对我国核试验的几点回顾与思考)," (Chinese Academy of Engineering Physics (中国工程物理研究院), 2010).

²¹⁸ Jiadong Qian, "Statement at the Conference on Disarmament," in *Final Record of the 339th Plenary Meeting of Conference on Disarmament, Cd/Pv.339* (Geneva: Conference on Disarmament, February 13 1986).

Different from independent research institutes in the United States and other countries, most major Chinese research institutes were (and most still are) affiliated with certain government agencies and funded by the state. The above research institutes in particular had (and still have) direct communication channels to their “supervising” government agencies. This made it possible to submit reports and memos and provide policy advice to their “supervising” agencies. The following table illustrates their connection with specific Chinese government agencies. Such formal connections with supervising government agencies make it possible for researchers in these institutes to submit internal reports to relevant government agencies. They are also frequently consulted by relevant government agencies on technical and policy issues.²¹⁹

²¹⁹Pascal Abb, "China's Foreign Policy Think Tanks: Changing Roles and Structural Conditions," (GIGA Working Papers, 2013); Bates Gill and James Mulvenon, "Chinese Military-Related Think Tanks and Research Institutions," *The China Quarterly* 171(2002).

Table 7 Arms Control Research Institutes and Their Bureaucratic Connections

Research Institute	Sponsor Government Agency	Note
China Institute of Contemporary International Relations	Ministry of State Security (国家安全部)	Intelligence collection and analysis is an important part of the Ministry of State Security's responsibility
China Institute of International Studies	Ministry of Foreign Affairs (MFA)	CIIS is a subordinate unit of the Ministry of Foreign Affairs
Foreign Affairs College	Ministry of Foreign Affairs	Foreign Affairs College provides important research support to MFA and is an important source of personnel supply for MFA
Institute of American Studies	Chinese Academy of Social Sciences	As part of CASS, these institutes take research projects from relevant government agencies and offer policy advice
Institute of World Economic and Politics		
China Institute of International Strategic Studies (CIISS, formerly known as BIIS)	General Staff Department, the PLA	
Institute of Strategic Studies, National Defense University	Central Military Commission	National Defense University is one of three military research/education institutes that are under the direct leadership of the Central Military Commission

Publications

Publications by the Chinese nuclear arms control community were another channel of communication to promote their policy agenda and draw high-level attention to nuclear

arms control issues. This was done through two means: “internal circulation” and “open publication.”

“Internal circulation” was a type of semi-classified internal publication that was primarily circulated within certain government bureaucracies and was used to inform and advise policy makers. The emergence of “internal circulations” since the 1980s established channels for the dissemination of information and analysis across the bureaucracy.²²⁰ Some of the “internal circulations” were specifically focused on nuclear issues and were mostly prepared by the nuclear defense industry. The following is a list of such “internal circulations”:

- *Nuclear Weapons and High Technology* (核武器与高技术), originally named *Foreign Science and Technology Information* (国外科技资料), was published firstly in 1992 by the Science and Technology Information Center of CAEP.
- CDSTIC’s internal circulation publications:
 - *Arms Control Information Bulletin* (军控信息简报), published by CDSTIC’s Arms Control and Disarmament Research Department.²²¹
 - *Arms Control Research Newsletter* (军备控制研究通讯), published by CDSTIC’s Arms Control and Disarmament Research Department.²²²

²²⁰Medeiros, *Reluctant Restraint: The Evolution of China's Nonproliferation Policies and Practices, 1980-2004*.

²²¹Shuang (颜爽) Yan, "A Study on the Evolution of U.S. Nuclear Arms Control Policy after the Cold War (冷战后美国核军控政策的演变研究)" (National University of Defense Technology, 2009).

²²²"China Missile and Aerospace Digest (中国导弹与航天文摘)," (Beijing: China Aerospace Science and Technology Corporation Information Research Institute (中国航天科技集团公司信息研究所), 1994).

- *Selected Readings on Arms Control and Disarmament* (军控与裁军选读), published by CDSTIC's Arms Control and Disarmament Research Department.²²³

Besides “internal circulations,” the nuclear arms control community also produced an increasing amount of “open publications” to promulgate their research and analysis. The growth of open publications reflected the broadening scope of China’s arms control research.²²⁴ Figure 4 illustrates the number of research and policy analysis papers on the issue of CTBT that were openly published in Chinese journals. Such publications started to appear in the late 1980s and increased quickly before and during CTBT negotiations. Both scientists and policy analysts contributed to the rapid increase of open publications on CTBT, making their voices heard throughout the academic and policy circles.

²²³ Baochang (吴保昌) Wu, "Comprehensive Test Ban Treaty and India's Nuclear Policy (全面核禁试条约与印度核政策)," *Nuclear Weapons and High Technology* (核武器与高技术), no. 1 (1998).

²²⁴ Medeiros, *Reluctant Restraint: The Evolution of China's Nonproliferation Policies and Practices, 1980-2004*.

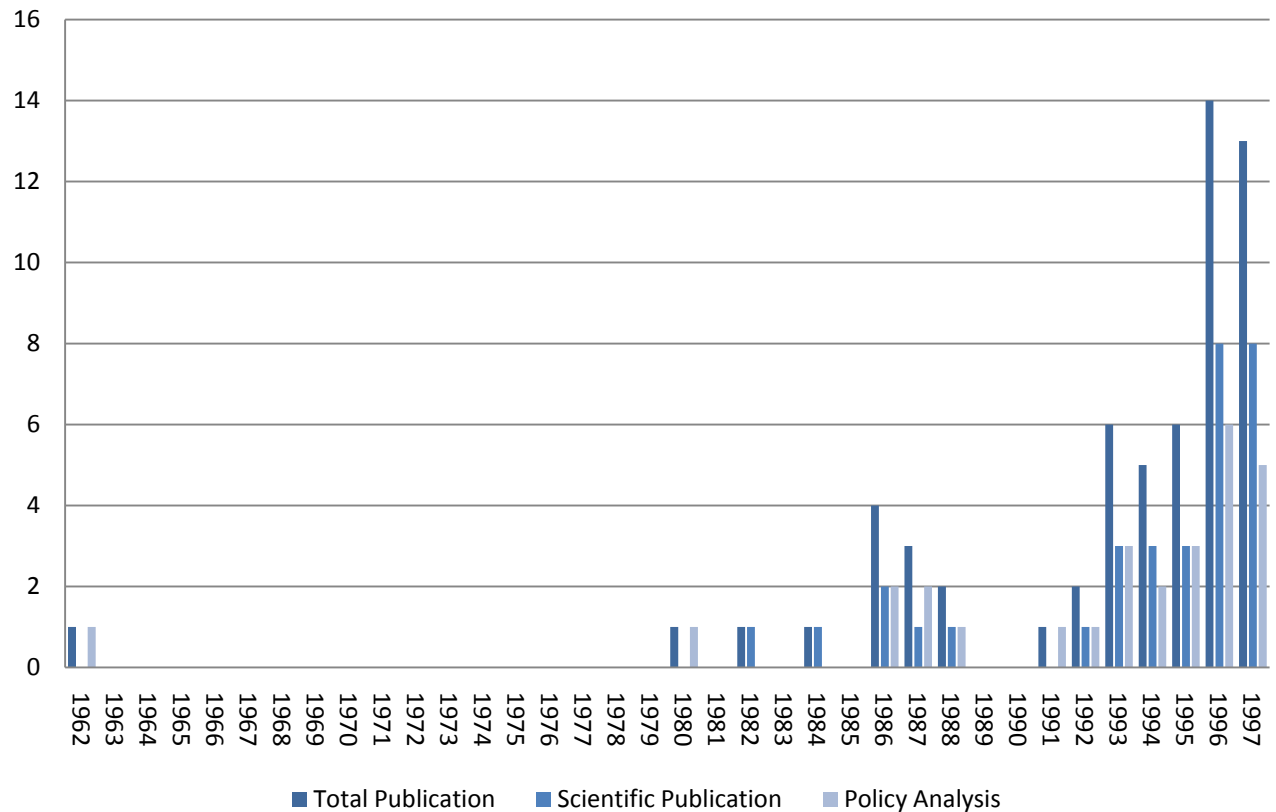


Figure 4 Chinese Open Publications on CTBT

Increasing Attention and Changed Perception at the Top Level

As one Chinese nuclear scientist noted, during the Cold War years, Chinese leaders rarely consider arms control a relevant issue because of “the sharp gap between its nuclear arsenal and those of the principal nuclear powers” and “its deeply rooted mistrust of the superpowers.”²²⁵ But as China’s nuclear arms control community was making a louder

²²⁵Xiangli (孙向丽) Sun, *Implications of a Comprehensive Test Ban for China's Security Policy*(Center for International Security and Arms Control, Stanford University, 1997).

and louder voice for rethinking China's policies, the top leadership developed a "gradual toleration and willingness" to consider arm control and nonproliferation.²²⁶

MFA tried several times during the 1980s and into the 1990s to upgrade the Fourth Division to the Department of Arms Control and Disarmament (which is one level higher within the government bureaucracy) but failed. The request was believed to be denied for at least two reasons. One was that other bureaucratic players like the defense industry and the PLA had concerns that the MFA would dominate the interagency policy-making and coordinating process. Secondly, and more importantly, Chinese top leaders did not believe that arms control was an important enough issue to deserve a department in the MFA. As late as the early 1990s, Chinese leaders still saw arms control as primarily a U.S.-Soviet issue and a reflection of super power rivalry. China, in their views, was a developing country with a "peaceful foreign policy" and "defensive military policy" and therefore had little to do with arms control. Chinese arms control experts disagreed.²²⁷ The Department of Arms Control and Disarmament was finally created in 1997.

Operational-level engagement was also quite effective in bringing about perception change at the very top level about some of the most basic but highly important concepts in the field of international arms control. Prior to international engagement, "disarmament" (裁军) was the only politically correct term in the Chinese lexicon. "Disarmament" was what the developing countries demanded and what China

²²⁶Hsu, "The Impact of Government Restructuring on Chinese Nuclear Arms Control and Nonproliferation Policymaking."

²²⁷Johnston, *Social States: China in International Institutions, 1980-2000*; *ibid.*

supported.²²⁸ In comparison, “arms control” was a negative term—it was what the superpowers used to consolidate their quantitative and qualitative advantage in military technology and capability and to avoid comprehensive and complete disarmament. Even in the *Global Military Yearbook* published in 1991 by the PLA Press, “arms control” was still defined as “an important element of the American and Soviet nuclear strategic thoughts.”²²⁹

The change of perception really took place at the operational level. During the Track II exchanges, Chinese participants developed a deeper and much more sophisticated understanding of arms control. They began to accept the utility of arms control and started to argue that China should embrace arms control issues and develop its own arms control policy. For example, Du Xiangwan at the Chinese Academy of Engineering Physics wrote a textbook in the early 1990s to train China’s arms control specialists: *The Scientific and Technological Foundation of Nuclear Arms Control* (核军备控制的科学技术基础). The book noted that arms control can help reduce dangers of military conflicts, reduce the likelihood of wars, and prevent the escalation of conflicts after they break out.²³⁰ Such views about the utility and objectives of arms control fall well in line with Western thinking on arms control.²³¹

²²⁸Liu, *Handbook on Arms Control and Disarmament* (军备控制与裁军手册).

²²⁹“On Nuclear Arms Control Theoretical Research and Nuclear Disarmament (关于核军备控制理论研究和核裁军),” in *Global Military Yearbook* (世界军事年鉴)(Beijing: The PLA Press (解放军出版社), 1991).

²³⁰Du, *The Scientific and Technological Foundation of Nuclear Arms Control* (核军备控制的科学技术基础).

²³¹See, for example, Graham T Allison and Frederic A Morris, “Armaments and Arms Control: Exploring the Determinants of Military Weapons,” *Daedalus* (1975); Bernard Brodie, “On the Objectives of Arms Control,” *International Security* 1, no. 1 (1976).

Chinese experts began to invite their American colleagues to visit and discuss arms control issues.²³² During this period, Chinese experts also started to publish articles in Chinese journals to introduce arms control policy research institutes in the United States (e.g., the Center for International Security and Arms Control at Stanford University) to their research.²³³ Arms control research as an academic subfield was also embraced and promulgated in China by China's first generation of arms control experts.²³⁴ Because CTBT is an arms control rather than disarmament agreement, China's shift of perception at the beginning of the 1990s and the ultimate acceptance of "arms control" as a relevant concept paved the way for China's participation in the CTBT negotiations.²³⁵ China's perception toward verification was also significantly changed as a result of Track II dialogues. This change of perception made it possible for China to reach an important agreement with other countries during the CTBT negotiations.

In the early 1980s, China's proposals submitted to the CD always contained very vague ideas about technical details such as verification. They tended to present normative appeals for compliance with arms control agreements, and they tended to aim at achieving rather ambitious arms control objectives without paying attention to whether it was technically possible to verify compliance. For the Chinese, compliance was more of

²³²Cuncheng (冯存诚) Feng, "American Arms Control Experts Visited China (美国军备控制专家来华交流)," *Social Sciences Abroad (国外社会科学)*, no. 6 (1993).

²³³Guangrong (游光荣) You, "Introduction of the U.S. Center for International Security and Arms Control (美国国降安奎与军备性刹中心简介)," *Soft Sciences in China (中国软科学)*, no. 1 (1996).

²³⁴Min (于敏) Yu et al., "Study on Nuclear Physics, Nuclear Technology and Related Disciplines at Caep (中国工程物理研究院的核物理、核技术及相关学科的研究)," *Nuclear Physics Review (核物理动态)* 12, no. 4 (1995).

²³⁵Liu, "On the Characters of the Struggle of International Arms Control (论国际军控斗争的性质)."; Kaibing (朱凯兵) Zhu and Yanan (刘亚南) Liu, "China's Achievement in International Arms Control in Spite of Difficulties and Challenges (论中国在国际军控困境和挑战中的作为)," *Journal of PLA Nanjing Institute of Politics (南京政治学院学报)* 21, no. 6 (2006); Sun and Wang, "Current Status and Future Trend of Nuclear Arms Control Research (核军备控制研究的现状与前景)."

a normative obligation than something that had to be strictly verified. Chinese proposals usually contained little discussion about incentive structures, credibility, or compliance issues. The term “verification” was not accepted or used by the Chinese.²³⁶

During interaction with American scientists and arms control experts, Chinese arms control specialists apparently developed a much more open view toward “verification” as usually understood in the Western literature and policy circles. In their publications, they acknowledged that verification is a necessary part of arms control and that this could be done through unilateral means, bilateral means, and/or multilateral means. Even on the issue of on-site inspection—which China had been greatly concerned about²³⁷—they began to appreciate the necessity of on-site inspections for arms control verification purposes.²³⁸

As Chinese arms control specialists became increasingly familiar with the technical issues related to arms control verification, they also became capable of and confident about arguing about technical details of verification regimes. Chinese seismologists’ substantial involvement in CTBT negotiation is one good example.²³⁹

²³⁶“Chinese Delegation Proposals on the Main Contents of a Convention on the Prohibition of Chemical Weapons,” in *Conference on Disarmament*(Geneva: CD/102, June 3 1980).

²³⁷Jin (徐进) Xu, “Exposing the U.S.’ Nuclear Blackmail (揭穿美国的核讹诈),” *World Affairs (世界知识)*, no. 17 (1962).

²³⁸Liping (夏立平) Xia, “China Making Progress on Adopting Confidence-Building Measures with Other Countries (中国与其它国家建立信任措施的进展),” *Contemporary Asia-Pacific Studies (当代亚太)*, no. 6 (1996).

²³⁹Shaoxie (许绍燮) Xu, “Seismic Verification and Seismic Research (地震核查与地震研究),” in *Collection of Abstracts of the Fifth Convention of China’s Seismology Association (中国地震学会第五次学术大会论文摘要集)*(1994).

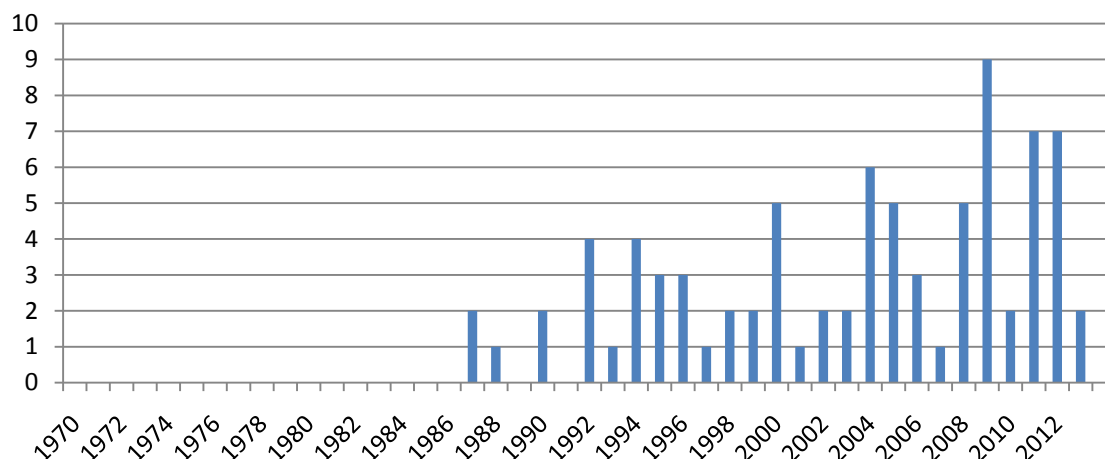


Figure 5 Number of Chinese Publications on Arms Control Verification, 1949–2013²⁴⁰

The concept of effective verification has been gradually embraced in Chinese official rhetoric since the 1990s. The Chinese white paper on arms control and nonproliferation in 1995 took a positive view toward arms control verification.²⁴¹ In recognition “of the complexity of the problems relating to the verification mechanism,” Chinese official statements have begun to support the establishment of “effective and feasible verification measures” and emphasize the importance of preventing the abuse of verification.²⁴²

CTBT Issues Discussed during Operational-Level Engagement

To better understand the extent of influence of operational-level engagement on the CTBT negotiations outcome, this section examines the specific issues discussed during U.S.-China operational-level exchanges. This will be compared with the results of official

²⁴⁰ To save space and make the chart more illustrative, the years between 1945 and 1969 are not shown. There was zero publication during this period.

²⁴¹ “China: Arms Control and Disarmament,” (Beijing: Information Office of the State Council Of the People’s Republic of China, 1995).

²⁴² “China’s National Defense in 2010 (2010 年中国的国防),” (Beijing: Information Office of the State Council Of the People’s Republic of China (中华人民共和国国务院新闻办公室), 2010).

CTBT negotiations in the next section. As mentioned above, during 1990 and 1996, the United States and China carried out a series of intensive exchanges at the operational level. Such exchange programs offered opportunities for nuclear scientists and experts from both countries to discuss theoretical and technical issues related to CTBT. They also functioned as an unofficial channel of communication through which the two countries could test out each other's positions and receive feedback with regard to the other's new positions. Five major issues were discussed during these exchanges.

Definition and Scope of the Treaty

The definition of nuclear explosion and scope of the treaty were one of the major disagreements among negotiating parties. There was a major gap between nonnuclear weapons states and nuclear weapons states regarding their preferred definition of nuclear explosion. Most nonnuclear weapons states wanted the treaty to prohibit all kinds of nuclear explosions. In contrast, nuclear weapons states hoped to continue certain types of non-explosive emulation tests in order to ensure the safety, security, and reliability of their existing stockpiles. In addition, there was no agreement among the nuclear weapons states themselves. The United States, for example, considered a yield limit of up to 1 kiloton and later proposed to allow nuclear explosions with yield of no more than 1.8 kilogram.²⁴³

On the definition and scope of CTBT, Chinese scientists advocated for “zero yield” from the very beginning. They believed that allowing low-yield tests would contradict the spirit of CTBT. In the U.S. domestic debate, however, there were a lot of different

²⁴³Rebecca Johnson, *Unfinished Business: The Negotiation of the Ctbtt and the End of Nuclear Testing*(Scott Allen, 2009).

voices.²⁴⁴ During the exchanges, American scientists were cognizant of China's resolve to stick to "zero yield," and Chinese scientists came to understand the intense debates within the U.S. on this issue. In 1994, the Jason Committee conducted a review of the necessity of continuing nuclear tests and concluded that the United States did not need to conduct low-yield tests in the future. Their conclusions were generally accepted by the U.S. scientific community. As a result, although the official negotiating teams from the two countries had different positions, scientists from the two countries had largely reached a consensus on "zero yield." Such a consensus provided much needed confidence for their governments, encouraged them to accept "zero yield," and therefore paved the way for moving the negotiation forward.²⁴⁵

Activities Not Prohibited under the Treaty

For the CTBT negotiations to succeed, one important prerequisite was that the treaty must allow the nuclear weapons states to be able to continue ensuring the safety, security, and reliability of their nuclear stockpiles including conducting subcritical tests and other non-violating experimental activities. Therefore, the nuclear scientists from the five nuclear weapons states got together and cooperated on creating a list of activities not prohibited by the treaty on the basis of their common understanding of science and technology. This list of permitted activities helped strike a balance among the five nuclear weapons states on preserving their core national security interests without overly agitating nonnuclear weapons states. Because the scientists successfully reached

²⁴⁴Paine, Christopher E. 1993. The U.S. debate over a CTB Washington DC: Natural Resources Defense Council

²⁴⁵Zhao, "Track Two Dialogue between the U.S. And China on CtbT Negotiations (二轨外交与中美全面禁止核试验条约谈判)."

consensus on this list in advance, the negotiating teams from the nuclear weapons states maintained an implicit agreement with each other in Geneva.²⁴⁶ Even when different voices were heard on the media, they managed to downplay the differences and to keep a relatively unitary position.²⁴⁷

Peaceful Nuclear Explosion

During CTBT negotiations, Chinese experts for a long time held the view that peaceful nuclear explosions (PNE) should not be prohibited because they might have potential nonmilitary values. They believed that through international monitoring and verification, peaceful nuclear explosions could be distinguished from nuclear weapons tests.

Some analysts argued that the issue of peaceful nuclear explosion was purely an excuse used by China to delay the negotiations in Geneva. This cannot be completely accurate based on the empirical evidence. General Qian Shaojun, the top nuclear scientist on the Chinese delegation to the CTBT negotiation, delivered a statement to the NTB *ad hoc* committee on January 26 1996, stating, “It is true that PNE have so far only been conducted by the United States and former Soviet Union. It is also true that the experts of these two countries had different assessments on the economic and environmental impact of PNE. But different experts of each country had differences of opinion on PNE even among themselves and these differences are not sufficient to negate the potential

²⁴⁶ Ibid.

²⁴⁷ Rebecca Johnson, *Unfinished Business: The Negotiation of the Ctbtt and the End of Nuclear Testing*, vol. 9 (Scott Allen, 2009).

technological benefits of PNE or to provide a good ground to ban PNE as a technology.”²⁴⁸

Russia’s position on PNE, for example, was equivocal. The Russian delegation spoke neither for nor against PNE and maintained that it would not obstruct consensus on banning PNE. Behind the scenes, however, during communication between Russian and Chinese scientists, Russian scientists and officials from the Russian Ministry of Atomic Energy provided data to their Chinese colleagues, and the data turned to show that PNE could be safe and economically viable for a developing country.²⁴⁹

According to one Chinese expert who participated in the negotiations, China’s nuclear weapons program started later than other nuclear weapons states. As a result, China conducted a limited number (45) of nuclear weapons tests but had not have time to start PNE studies. In the early 1980s, the Ministry of Petroleum Industry actually requested that Chinese nuclear experts study the application of PNE to oil extraction in order to increase the oil output of the Daqing Oil Field, which faced a technical challenge for maintaining a high oil output at that time.²⁵⁰ China also considered using nuclear explosions in its historic South-to-North Water Diversion Project. There are a number of publications written by Chinese scientists and engineers for studying the utility of PNE in civilian construction projects.²⁵¹ In 1996, China held a nationwide conference in Beijing

²⁴⁸Shaojun (钱绍钧) Qian, "General Qian Shaojun's Statement at the Ntb Ad Hoc Committee," in *Conference on Disarmament*(Geneva January 26, 1996).

²⁴⁹Rebecca Johnson, *A Comprehensive Test Ban Treaty: Signed but Not Sealed*(Disarmament Intelligence Review, 1997).

²⁵⁰Zou, "China and the Ctbt Negotiations."

²⁵¹Tian and Hu, "Peaceful Nuclear Explosion and Comprehensive Nuclear Test Ban (和平核爆炸与全面禁止核试验)."

to further explore the issue of PNE and its civilian value.²⁵² Thus, for economic considerations, China did not want PNE to be stopped.²⁵³

Because of the gap in their views, scientists from China and the United States conducted a series of dialogues and exchanges on the issue of peaceful nuclear explosion, particularly during the visit of the Chinese Academy of Engineering Physics to the United States in 1996. They analyzed the history of U.S. and Russian peaceful nuclear explosion plans, China's technical capacity, the potential cost versus benefit of conducting peaceful nuclear explosion, and its impact on CTBT verification. On the basis of this, American experts suggested their Chinese colleagues give up the option of peaceful nuclear explosion. The two sides ultimately decided to agree to disagree and concluded that it would be necessary to further study the theoretical feasibility of making use of peaceful nuclear explosions.

Effectiveness of CTBT Verification Regime

The CTBT's verification regime consists of several elements: the International Monitoring System that has 321 monitoring stations and 16 laboratories built around the globe, the International Data Center located in Vienna, a global communications infrastructure that transmits data collected by the International Monitoring System back to the International Data Center, a procedure for consultation and clarification, a set of

²⁵²Xianjue (彭先觉) Peng, "Exploiting the Other Side of "Nuclear Explosion" (开发“核爆炸”的另一面)," *Scientific Chinese (科学中国人)*, no. 6 (2005).

²⁵³Wang and Sun, "A Collection of Arms Control Research Papers (军备控制论文集)."Zou, "China and the Ctbtt Negotiations."

confidence-building measures, and on-site inspections that are used when an issue cannot be addressed satisfactorily through other means.²⁵⁴

The development of a verification regime is one of the factors that played an important role in ensuring the successful conclusion of CTBT negotiation. Verification technology had been a major concern for both Chinese and American scientists and has been an important topic in their exchange programs since 1993. Scientists from the two countries also engaged in cooperative research programs in verification technology development in order to develop shared technologies and to increase experience and build confidence in verification technologies. The United States was far ahead of China in terms of arms control verification technology development, and Chinese scientists got to know more about some of the concepts and unclassified technologies during these exchanges. After obtaining a better understanding of the role of verification technology, Chinese scientists also began to set up their own verification technology research and verification system.²⁵⁵

Many Chinese scientists' proposals on CTBT verification were not incorporated into the final treaty draft, however. For instance, China proposed an international network of satellites and EMP sensors to ensure coverage of upper atmospheric and space nuclear explosions. Chinese experts saw satellite monitoring as the most effective, timely, and reliable means of detecting atmospheric and space nuclear explosions.²⁵⁶ This was

²⁵⁴"The Ctbt Verification Regime: Monitoring the Earth for Nuclear Explosions," (Vienna: Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization).

²⁵⁵Xu, "Seismic Verification and Seismic Research (地震核查与地震研究)."; Chen and Wang, "U.S. Visit Report: Technical Information Regarding Nuclear Arms Control, Monitoring, and Verification, March 23-April 5, 1996 (访美专题汇报---核军控、检测、核查技术方面信息 (1996年3月23日-4月5日))."

²⁵⁶"Statement at Working Group I, Ntb Ad Hoc Committee," (August. 17, 1994).

supported by previous monitoring of South African and Indian nuclear experiments.²⁵⁷

The EMP monitoring system was also seen as a useful verification technique because of its high sensitivity, precise location, and prompt response. Chinese scientists argued that only an EMP sensor network would be able to detect low-yield nuclear testing at a high altitude because EMP sensors have unique advantages: high sensitivity, easy operation, reliable performance, and relatively low cost.²⁵⁸

Chinese experts believed that none of the four technologies included in an IMS system could effectively monitor nuclear explosions in the upper atmosphere or space. The IMS would be incomplete if it depended only on these monitoring techniques, and it would be unable to fully accomplish CTBT's mission to monitor nuclear explosions in all environments.²⁵⁹ However, the view of the Chinese scientists was not very influential in Geneva. Many technologically advanced countries dismissed China's proposal and argued that satellites and EMP sensors would be too expensive to employ.²⁶⁰ The final treaty draft only includes four types of monitoring technologies—seismic, hydroacoustic, infrasound, and radionuclide and noble gas. Satellites and EMP sensors were excluded from the International Monitoring System.

²⁵⁷ Jincheng (张金城) Zhang, Qixiong (范启雄) Fan, and Jiadan (周家丹) Zhou, "Some Discussion on the Function of Satellite Remote Sensing on Ctbtt (卫星遥感在全面禁止核试验条约验证中的作用)," *Global Nuclear Geological Science (世界核地质科学)*, no. 3 (2003).

²⁵⁸ Frieman, *China, Arms Control, and Nonproliferation*.

²⁵⁹ "Working Paper: Establishment of a Global Electromagnetic Pulse Monitoring System," (CD/NTB/WP.217, February 20, 1995).

²⁶⁰ Johnson, *Unfinished Business: The Negotiation of the Ctbtt and the End of Nuclear Testing*, 9; Zou, "China and the Ctbtt Negotiations."

Maintaining the Safety, Security, and Reliability of Nuclear Arsenals under CTBT

American nuclear scientists played an important role in setting up the nuclear stockpile stewardship programs in the United States for the purpose of ensuring the safety, security, and reliability of the U.S. nuclear arsenal. Compared with American scientists, Chinese scientists were more concerned about how to maintain their nuclear stockpile after CTBT enters into force. This was because the number of Chinese nuclear tests was only a tiny fraction of the U.S. nuclear tests, and China had much less data than the United States on which they could rely to maintain their nuclear arsenal. As a result, maintaining the safety, security, and reliability of nuclear stockpiles without nuclear testing became a key topic in U.S.-China scientific exchanges. China paid serious attention to U.S. domestic studies (unclassified) about the American SBSS program. Chinese scientists also learned in Track II dialogues about how the United States conducted its nuclear stockpile stewardship programs, and they seemed to become more confident about this issue after they came out of the discussions with their U.S. colleagues.²⁶¹

Major Issues in Official CTBT Negotiations between the United States and China

The Chinese negotiation team at the CD was headed by Ministry of Foreign Affairs officials. Senior experts from CAEP and IAPCM also served on the team for technical

²⁶¹Zhao, Hong (赵宏). 2006. Track Two Dialogue between the U.S. and China on CTBT Negotiations (二轨外交与中美全面禁止核试验条约谈判), Institute of International Studies (国际问题研究所), Tsinghua University (清华大学), Beijing.

advice.²⁶² During the negotiations, the United States and China disagreed on four major issues.

NFU and NSA

One of the major disagreements between China and the United States was that China wanted to link the CTBT to a prohibition of first use of nuclear weapons and to a commitment to negative security assurances for nonnuclear weapons states. China submitted several working papers on the issue of NFU and NSA.²⁶³ The Chinese reasoning was that since the CTBT would essentially freeze the nuclear gap between nuclear weapons states and nonnuclear weapons states, it was the responsibility of nuclear weapons states to adopt the No First Use policy and negative security assurances to guarantee nonnuclear weapons states that they would not face the threat of nuclear attack.²⁶⁴

China wanted all nuclear weapons states to commit to the NFU policy as a precondition for the CTBT negotiation and proposed that NFU and NSA be included in the preamble rolling text of the CTBT. China's insistence on NFU and NSA was not surprising. China has always stood for an unconditional commitment by all nuclear weapons states not to use or threaten to use nuclear weapons against any nonnuclear weapons states or nuclear-free zones and not to be the first to use nuclear weapons against others. China believes that all nuclear weapons states should provide security assurances to nonnuclear weapons states in the form of legally binding international instruments in order to compensate for

²⁶² Johnston, *Social States: China in International Institutions, 1980-2000*.

²⁶³ "Proposed Wording for the CtbT Article on 'Security Assurances for States Parties,'" in *Conference on Disarmament* (Geneva: CD/NTB/WP.122, June 20 1994); "Proposed Wording for the Preamble to the CtbT," in *Conference on Disarmament* (Geneva: CD/NTB/WP.124, June 20 1994).

²⁶⁴ "Disarmament," *Newsletter of the UN Centre for Disarmament Affairs* 12, no. 3 (1994).

the inherent imbalance of the Nuclear Nonproliferation Treaty.²⁶⁵ According to Ambassador Hou Zhitong, such provisions would greatly reduce the danger of nuclear conflict, enhance security for all countries, and create favorable conditions for accelerating the nuclear disarmament process.²⁶⁶

The United States was a strong opponent against the Chinese proposals regarding NFU and NSA. From the U.S. perspective, a military doctrine could still be defensive even if it does not adopt an explicit NFU policy. More importantly, the United States had security commitments to allies and therefore had much broader interests to protect than China did. NFU could be perceived as a decrease of U.S. commitment to its NATO allies, Japan, and South Korea, and might therefore reduce regional stability.²⁶⁷ Facing strong opposition from the United States and others, China later agreed to withdraw from the rolling text its proposed text on negative security assurances to nonnuclear-weapon states and mutual no first use of nuclear weapons among the nuclear weapon states.²⁶⁸

Peaceful Nuclear Explosion

There was one issue over which American and Chinese scientists did not manage to resolve their disagreement and that was the issue of peaceful nuclear explosion. After several discussions with their American counterparts, Chinese nuclear scientists were still not convinced that peaceful nuclear explosion was of little practical use. Chinese scientists' insistence seems to be related to their relative lack of empirical experience

²⁶⁵Zukang Sha, "Statement at the Fourth Preparatory Committee for the 1995 Review and Extension Conference for the Npt," (January 23 1995).

²⁶⁶Zhitong Hou, "Ambassador Hou Zhitong's Statement at the U.N. Disarmament Commission," (April 19, 1994).

²⁶⁷Harold A Feiveson and Ernst Jan Hogendoorn, "No First Use of Nuclear Weapons," *The Nonproliferation Review* 10, no. 2 (2003).

²⁶⁸Zou, "China and the Ctbt Negotiations."

with conducting peaceful nuclear explosion experiments.²⁶⁹ They therefore wanted their government to support their view that peaceful nuclear explosion should not be prohibited under the treaty.²⁷⁰ This was the only disagreement between Chinese and American nuclear scientists among all the major issues debated in the negotiations.

This view of the Chinese scientists was reflected in China's official CTBT negotiations positions. Since March 1994, China has repeatedly raised the issue of peaceful nuclear explosion in its working papers to the CD and has stated that no international legal instrument on nuclear disarmament and nuclear nonproliferation "should obstruct or restrain the development and peaceful uses of science and technology, nor impair the legitimate right of States Parties, the mass of developing countries in particular, to make peaceful use of nuclear energy."²⁷¹ In accordance with the view of Chinese scientists, the Chinese delegation at the CD pointed out that the exploration of PNE was far from finished and that PNE had great potential to be used for peaceful purposes that would benefit human beings as a whole.²⁷²

China's proposed treaty language on PNE, however, proved very much controversial. A limited number of countries, such as Algeria and Iran, expressed interest in further consideration of the issue, but an increasing number of countries came to the conclusion that it was too difficult to distinguish peaceful nuclear explosions from military nuclear tests. After advocating for the right of conducting peaceful nuclear explosions in the

²⁶⁹Findlay, *Nuclear Dynamite: The Peaceful Nuclear Explosions Fiasco*.

²⁷⁰Xiangwan (杜祥琬) Du and Side (胡思得) Hu, "Nuclear Arms Control and Physics (核军备控制与物理学)," *Physics (物理)*, no. 11 (1995).

²⁷¹"Ctbt Article on "Peaceful Uses of Nuclear Energy and Peaceful Nuclear Explosion," in *Conference on Disarmament*(Geneva: CD/NTB/WP.167, August 23, 1994).

²⁷²"Peaceful Use of Nuclear Energy and Peaceful Nuclear Explosion - Statement of the Chinese Delegation at the Working Group I of the Ntb Ad Hoc Committee," in *Conference on Disarmament*(Geneva March 9, 1995).

initial negotiations, Chinese security policy makers later decided to compromise. They agreed on Canadian-proposed language that essentially says that PNE would be banned under the CTBT but the issue could be rediscussed later at a review conference; if the review conference decides by consensus that PNE may be permitted, an appropriate amendment to the treaty should then be made. This later became the final draft of Article VIII of the CTBT.²⁷³

National Technical Means

The role and status of national technical means became another issue of major disagreement, primarily between the United States and China. The controversy over national technical means involved two aspects: First, should national technical means be allowed in the CTBT verification system? Second, could countries use information obtained through national technical means to request on-site inspections? In the Cold War context, NTM refers to the technical means that belong to and are operated by a state, and usually includes imaging satellites, signal intelligence, communication intercepts, and human intelligence.²⁷⁴ The United States, Britain, France, and a few other countries wanted to have quick access to any suspect site and demanded that information provided by NTM should be treated as equal to data collected by the International Monitoring System.

China, India, and Pakistan, among others, insisted that taking into consideration the fact that there were significant asymmetries in national technical means, NTM should not be

²⁷³"Comprehensive Test Ban Treaty Text," Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO), <http://www.ctbto.org/the-treaty/treaty-text/>.

²⁷⁴Patricia M. Lewis, "China and the Nuclear Test Ban," *China Review*, no. Autumn/Winter (1996).

used to trigger on-site inspections.²⁷⁵ China was particularly unhappy with the U.S. position on NTM. Ambassador Sha's 1995 speech at the CD plenary session emphasized the danger of NTM, and he implicitly indicated that this danger mainly came from the United States:

"One country ... should take advantage of their exclusive NTM and monopolize international verification in disregard of the IMS with a self-assumed mandate of 'world Police.' ... The institutionalization of NTM in the CTBT would be tantamount to legalizing the ability of one State party or a small group of States parties with superior technical means to police the world, conduct all kinds of activities, including espionage, against other State parties and keep watch over the majority of States parties that do not have such means."²⁷⁶

China, however, possessed no real leverage over the issue of NTM and finally agreed on a compromise that NTM would only be used as a supplement to IMS data, and IMS data would serve as the primary basis for triggering an on-site inspection. As a result, the final language in the treaty (Article IV, Paragraph 5) states, "[F]or the purposes of this Treaty, no State Party shall be precluded from using information obtained by national technical means of verification in a manner consistent with generally recognized principles of international law, including that of respect for the sovereignty of States."²⁷⁷

²⁷⁵"Statement by Ambassador Sha to the Conference on Disarmament," in *Conference on Disarmament*(Geneva: CD/PV.717, September 5 1995).

²⁷⁶Ibid.

²⁷⁷"Comprehensive Nuclear Test-Ban Treaty (Ctbt)," The Preparatory Commission for the Comprehensive Nuclear Test-Ban Treaty Organization (CTBTO), http://www.ctbto.org/fileadmin/content/treaty/treaty_text.pdf.

On-Site Inspection Approval Procedure

A major disagreement between the U.S. delegation to the CTBT negotiation and the Chinese delegation was over the procedure of approving on-site inspections. The United States was a strong supporter of the “3/4 red light approach,” which means after a state submits a request to conduct an on-site inspection, the on-site inspection (OSI) request is automatically approved unless more than three-fourths of the member states reject the OSI within 24 hours. The objective of the United States and many other countries was to create a fairly easy approval procedure for conducting OSI. They wanted to make sure that the bar was set low enough so that on-site inspections would not be obstructed by a small number of countries. The concern of Chinese security policy makers, however, was that such a low bar for conducting OSI would encourage some countries to abuse OSI by requesting and conducting many more OSIs than necessary and therefore threaten the national security of the inspected party. In contrast, China proposed the “2/3 green light approach,” which meant that an on-site inspection request would not be automatically approved unless two-thirds of the member states agreed for it to go ahead. This would set a much higher bar to approving an on-site inspection.²⁷⁸

The Chinese lead negotiator, Ambassador ShaZukang, was so concerned about OSI being abused by technically advanced states, he was vehemently opposed to the “3/4 red light approach.” The U.S. lead negotiator, Ambassador Stephen J. Ledogar, was a strong proponent of the “3/4 red light approach.” Neither of them would make compromises,

²⁷⁸ Wu, Zhan (吴展). 1998. Issues Related to Comprehensive Nuclear Test Ban (关于全面禁止核试验的问题). *American Studies* (美国研究) (3):7-27.

and the dispute between the Chinese and U.S. ambassadors led the entire negotiations into a stalemate.²⁷⁹

Both China and the United States were under tremendous and increasing international pressure. Ambassador Ledogar later withdrew from his original position and offered a step-by-step compromise by proposing a “2/3 red light approach,” a “1/2 red light approach,” and a “1/2 green light approach” at different stages of the negotiation. But Chinese concern about OSI abuse was so strong that they would not take yes for an answer.²⁸⁰ As Chinese ambassador ShaZukang pointed out, OSI was a crucial factor in the “success or failure of the talks on the treaty.”²⁸¹ As a result, they chose to up the ante by raising the tension to the top leadership level.

Chinese president Jiang Zemin personally wrote to President Clinton stressing the importance of addressing China’s concern about the “1/2 green light approach” for approving on-site inspection requests. China’s vice prime minister Qian Qichen, who was also the foreign minister, met with U.S. secretary of state Warren Christopher to convey the view that the treaty could not be passed without revision of the 1/2 green light approach.²⁸²

The fight ended only after the United States and China finally agreed to settle on a “30/51 green light approach,” largely because of U.S. preference to get a treaty before the U.N.

²⁷⁹Zong, Daoyi (宗道一). 2000. "General Sha" in Comprehensive Nuclear Test Ban Treaty Negotiations (全面禁止核试验条约谈判中的沙大将军). *Extensive Reading About CCP History (党史博览)* (10):28-35.

²⁸⁰Zong, Daoyi (宗道一). 2000. U.S. and China Crossing Swords in Geneva: Ambassador ShaZukang in the Negotiations of the Comprehensive Nuclear Test Ban Treaty (中美在日内瓦的一次交锋: 记全面禁止核试验条约谈判中的沙祖康大使). *Culture and History (文史精华)* 4 (119):4-12.

²⁸¹"Prc: Representative on the Nuclear Test Ban Treaty," (FBIS-CHI-96-117, June 17, 1996).

²⁸²Zong, Daoyi (宗道一). 2000. "General Sha" in Comprehensive Nuclear Test Ban Treaty Negotiations (全面禁止核试验条约谈判中的沙大将军). *Extensive Reading About CCP History (党史博览)* (10):28-35.

General Assembly opened in September 1996. The United States also made a commitment to China regarding possible abuse of CTBT verification. In a letter sent from U.S. secretary of state Warren Christopher to China's vice premier and minister of foreign affairs Qian Qichen on September 20, 1996, Christopher reassured Qian that the United States understood China's concern on NTM and was committed to compliance by all parties to the CTBT with these CTBT provisions against possible abuse.²⁸³

Comparing the discussions during the U.S.-China operational-level engagement and the process of official negotiation at the CD, operational-level engagement seems to have had a very positive influence on the official negotiation outcomes. Over the eight major issues, five were covered by the operational-level engagement before or during the negotiations. American and Chinese scientists were able to reach agreement on four of the five issues, which laid a very positive foundation for the official negotiations. These issues caused major debates and high-level tensions during the official negotiations among other negotiating countries, but U.S. and Chinese negotiators successfully avoided major clashes over these issues due, to a large extent, to the cooperative efforts of their nuclear scientists. Table 8 summarizes the impact of operational-level engagement on official negotiations over these major issues.

²⁸³Zou, "China and the Ctbt Negotiations."

Table 8 Influence of Operational-Level Engagement on Official Negotiations on Major CTBT Issues

Major Issues	Discussed during Operational-Level Engagement?	Consensus Reached during Operational-Level Engagement?	Influence of Operational-Level Engagement on Official Negotiations
Definition and Scope of the Treaty	Yes	Yes	Strong
Activities Not Prohibited under the Treaty	Yes	Yes	Strong
Peaceful Nuclear Explosion	Yes	No	Medium
Effectiveness of CTBT Verification Regime	Yes	Yes	Strong
Maintaining the Safety, Security, and Reliability of Nuclear Arsenals under CTBT	Yes	Yes	Strong
National Technical Means	Limited engagement	Partial agreement	Weak
NFU and NSA	No		
On-Site Inspection Approval Procedure	No		

Strategic Trust and U.S.-China CTBT Engagement

Strategic trust refers to the relationship in which the recognition of common interests motivates actors to cooperate but there is no recognition of shared moral principles or norms. In the CTBT case, whether operational-level engagement increased China's strategic trust in the United States depends on whether operational-level engagement

helped China identify new common interests with the United States and made China capable of finding ways to achieve these common interests. The answer to this question is yes, and this is accomplished through the following means.

First, operational-level engagement apparently played a critical role in the emergence of China's nuclear arms control community. Following successful U.S.-Soviet scientific engagement, American nuclear scientists initiated a similar engagement program with their Chinese colleagues. Chinese participants in these exchanges quickly benefited from these exchanges and became adamant advocates for more exchanges and developed a strong interest in policy research on issues related to nuclear arms control. The emergence of China's nuclear arms control community, therefore, benefited significantly from such operational-level engagement.

Second, operational-level engagement greatly promoted the growth of China's nuclear arms control community. Dialogues and exchange programs brought in new Chinese participants from new organizations and agencies and from increasingly diversified backgrounds. Such engagement was directly related to the quick expansion, pluralization, and professionalization of China's nuclear arms control community.

Third, operational-level engagement facilitated a stronger and more coherent internal interagency coordination mechanism in China on arms control issues. Chinese participants grew increasingly familiar with the American interagency policy-making process. As more and more Chinese organizations throughout the bureaucracy began to address arms control issues, they quickly established various interagency communication and coordination channels to facilitate policy discussions. As a result, the traditional

bureaucratic boundaries between different government agencies were essentially overcome.

Fourth, operational-level engagement facilitated bottom-up communication and influence within the Chinese bureaucracy. Because of operational-level engagement, Chinese nuclear scientists initiated the domestic discussion to reassess China's policies regarding the nuclear test ban. Chinese participants of the engagement programs gradually accepted and embraced some of the most important arms control concepts of their American colleagues. They also managed to reach agreements with their U.S. colleagues on many of the major issues about CTBT, which built the foundation for successful official negotiations. This perception change started at the bottom and managed to gradually influence thinking at the top level through bureaucratic connections and various internal and open publications.

Chinese top leaders began to recognize the importance of arms control policy and became more willing to involve themselves in arms control policy-making. Their perception about arms control and its relationship to China's security interests shifted significantly. This allowed them to recognize the existence of substantial common interests between China and the United States. President Jiang and Vice Premier Qian personally interfered during the CTBT negotiations and reached out to their American counterparts to seek common ground. Such recognition of new common interests and strong willingness to achievement the common interests is a strong indicator of increased strategic trust between the two countries.

Moralistic Trust and U.S.-China CTBT Engagement

Risk Taking and China's CTBT Decision

As mentioned in chapter one, moralistic trust is the existence of a sense of moral obligation that develops out of identification with the trustor and its moral/normative principles. The indicators of moralistic trust include the recognition of shared norms, the rejection of *realpolitik* thinking, and the willingness to accept risks in cooperation. In the CTBT case, one important but rarely discussed point is that China's decision to sign CTBT was not completely based on calculations of material interests. By agreeing to sign the CTBT, China actually assumed a great deal of the risk regarding its national security interests.

Risk for Nuclear Modernization

For China's nuclear complex, there was indeed a need to continue testing. As a latecomer to the P-5, China only began to experiment with miniaturizing its warhead designs in the mid-1980s. ZouYunhua mentioned that CTBT negotiations "caught China in the middle of its nuclear weapons program, whereas the United States, Russia, and Britain had completed several development cycles."²⁸⁴ The September 1993 test was the first test of an aspherical primary design—a feature that allows the warhead to have a much smaller diameter and therefore makes it easier to fit into the top of a missile.²⁸⁵ By the time that China conducted its last test in 1996, China had only conducted several tests to validate

²⁸⁴ Ibid.

²⁸⁵ William J. Broad, "Spies Vs. Sweat: The Debate over China's Nuclear Advance," *The New York Times*, 1999/09/07/ 1999.

its miniaturized warhead design.²⁸⁶ By comparison, the United States and Soviet Union had conducted far more tests to give them much higher confidence about the reliability of their warhead designs.²⁸⁷

With far less testing experience and far less data collected from nuclear tests, China's empirical nuclear design capability was certainly less advanced than the United States and Russia and possibly Britain and France. There has been evidence showing that China still has serious problems with warhead miniaturization and still does not possess sophisticated miniaturized warheads.²⁸⁸ This implies a number of significant risks for national security. First, signing the CTBT means China might have to give up important options for its nuclear modernization program and abandon more ambitious nuclear strategies than the minimum nuclear deterrence strategy. Strategies such as limited nuclear deterrence, flexible response, escalation dominance/control, and counterforce striking would be out of the question for China for the foreseeable future.

One Chinese author mentioned in an internal publication that if China would like to catch up and reach a rough parity with the nuclear stockpiles of other major nuclear powers, China would need to continue testing.²⁸⁹ Under CTBT, China certainly would not be able to develop any new nuclear warhead other than the very small number of warhead designs that it possessed by 1996. This means if the future security situation demands that

²⁸⁶Robert Johnston, "Database of Nuclear Tests, China-Prc,"

<http://www.johnstonsarchive.net/nuclear/tests/PRC-ntests1.html>; Jeffrey G Lewis, *The Minimum Means of Reprisal: China's Search for Security in the Nuclear Age* (MIT Press Cambridge, MA, 2007).

²⁸⁷"United States Nuclear Tests: July 1945 through September 1992," (Washington, DC: Federation of American Scientists).

²⁸⁸Debalina Chatterjee, "China's Nuclear Warhead Miniaturization and Its Impact on Its Ballistic Missiles," *Sri Lanka Guardian*, March 22, 2013.

²⁸⁹Zheng (吴铮) Wu, "Updates on Comprehensive Test Ban Treaty Negotiation (全面禁止核试验跳跃谈判进展情况)," *Trends in Foreign Nuclear Weapons (国外核武器动态)*, no. 3 (1996).

China develop more advanced, capable, and reliable warheads, or some type of special nuclear weapons, China will not be able to do it.

By comparison, even though the United States has many more available warhead designs (a total of eighty-five types of nuclear warheads for more than 100 types of weapon systems)—most of which are much more advanced and reliable than Chinese designs²⁹⁰—many in the U.S. government maintained that it would be too risky for the United States to give up the option of developing new nuclear warheads.²⁹¹ As a matter of fact, by 1996, China was still in the process of developing its first generation of solid fueled intercontinental ballistic missiles (ICBMs)—including the DF-31 and JL-2. Ending nuclear tests in 1996 might have significantly increased the uncertainty and difficulty of such development. Without DF-31 and a reliable submarine-launched ballistic missile, China's strategic nuclear force had been very much vulnerable.

Because of the lack of sophisticated warhead miniaturization capability, China was believed to have problems with developing and adopting Multiple Independently-Targeting Reentry Vehicle (MIRV) technology. Currently, all Chinese ballistic missiles carry only one warhead. For China, giving up MIRV capability means that China gives up the option of obtaining massive nuclear strike capability that all the other four of the P-5 countries possess.²⁹² Moreover, the lack of MIRV capability also has significant

²⁹⁰Thomas B Cochran et al., "Nuclear Weapons Databook, Volume II: US Nuclear Warhead Production-Natural Resources Defense Council, Inc," (Ballinger Publishing Company, Cambridge (Massachusetts), 1987).

²⁹¹Xiaosi (贺孝思) He, "Banning Nuclear Testing Would Paralyze the Trident Program (禁止核试验将使三叉戟等计划陷于瘫痪)," *Foreign Missile and Aerospace (国外导弹与航天)*, no. 01 (1986).

²⁹²Phillip C Saunders and Jing-dong Yuan, "China's Strategic Force Modernization: Issues and Implications for the United States," *Proliferation Challenges and Non-proliferation Opportunities for New Administration*, "Center for Nonproliferation Studies, Monterey Institute of International Studies, Occasional Paper, no. 4 (2000).

implications for the credibility of China's nuclear second-strike capability. MIRVing could substantially increase a country's nuclear retaliatory capability because MIRVing is a very useful way for penetrating mid-course and end-course missile defense systems.²⁹³ Without MIRVing, China has seriously limited its options for reinforcing the survivability of its limited nuclear weapons, particularly if the United States continues to build up its missile defense capability.

China's signing of the CTBT in 1996 also takes away its ability to develop sophisticated tactical nuclear weapons in the future. China at present is suspected of only possessing a very limit amount (about twenty) nuclear gravity bombs that can be dropped by the H-6 bomber. Some analysts suggested that China might have a small number of nuclear-capable cruise missiles (about twenty), but other analysts such as Hans Kristensen and Robert Norris noted that the "evidence for Chinese nuclear cruise missiles is sketchy and should be viewed with caution."²⁹⁴ Even if China does have a limited number of nuclear gravity bombs and cruise missiles, its tactical nuclear capability is still far behind that of the United States and Russia, and the gap will not be filled, because China needs nuclear tests to develop new tactical nuclear weapons. That means China completely gives up the option of obtaining meaningful tactical nuclear capability and the option of pursuing battlefield nuclear war-fighting capability.

Risk for Nuclear Safety and Security

Maintaining the safety and security of nuclear weapons is a high priority for all nuclear weapons states. Take the case of the United States for example. Out of the more than

²⁹³Sun, *Implications of a Comprehensive Test Ban for China's Security Policy*.

²⁹⁴Hans M Kristensen and Robert S Norris, "Chinese Nuclear Forces, 2013," *Bulletin of the Atomic Scientists* 69, no. 6 (2013).

1,000 nuclear tests carried out by the United States, a total of about 140 low-yield nuclear tests were for safety evaluation purposes.²⁹⁵ All U.S. weapons have been designed to be intrinsically one-point safe in the event of accidental detonation of the high explosives.²⁹⁶ They also employ multiple modern safety measures, such as Enhanced Nuclear Detonation Safety (ENDS), Insensitive High Explosive (IHE), and a Fire-Resistant Pit (FRP), which help prevent inadvertent or accidental explosions.²⁹⁷ Table 9 shows the safety features of the nuclear weapons in the existing U.S. nuclear stockpile.²⁹⁸

Table 9 Safety Features of Nuclear Weapons in the Existing U.S. Stockpile

Warhead	Weapon System	Stockpile Entry Date	Safety Features
B61	Gravity bombs	1980-present	ENDS, IHE
W88	Trident II	1990	ENDS
W87	Minuteman III	1986	ENDS, IHE, FRP
W80	ALCM, SLCM	1982, 1984	ENDS, IHE
B83	Gravity bomb	1983	ENDS, IHE, FRP
W78	Minuteman III	1980	ENDS
W76	Trident II	1979	ENDS

By comparison, given the very small number of nuclear tests that China had carried out in total (45), it is obvious that China had a long way to go to ensure the safety and security

²⁹⁵Thomas B Cochran and Christopher E Paine, *The Role of Hydronuclear Tests and Other Low-Yield Nuclear Explosions and Their Status under a Comprehensive Test Ban*(Natural Resources Defence Council, 1995).

²⁹⁶A nuclear weapon is one-point safe if, when the high explosive is initiated and detonated at any single point, the probability of producing a nuclear yield exceeding 4 pounds of TNT equivalent is less than one in 10⁶. See, for example: "Dod Nuclear Weapon System Safety Program Manual, Number 3150.02," (Washington DC: Department of Defense, January 31, 2014).

²⁹⁷Ray E Kidder, "Assessment of the Safety of Us Nuclear Weapons and Related Nuclear Test Requirements," (1991); Sun, *Implications of a Comprehensive Test Ban for China's Security Policy*.

²⁹⁸Hans M Kristensen and Robert S Norris, "Us Nuclear Forces, 2013," *Bulletin of the Atomic Scientists* (1974) 69, no. 2 (2013); Sun, *Implications of a Comprehensive Test Ban for China's Security Policy*.

of its nuclear weapons. Although China paid attention to the issue of safety and security of nuclear weapons and had conducted research to test warhead safety under harsh circumstances such as fire, falling, or collision,²⁹⁹ there is no indication that China had possessed modern safety measures.³⁰⁰ Chinese nuclear weapons scientists once informally proposed the idea that a nuclear ban treaty should consider allowing a limited annual quota of tests that could be used to ensure the improve the safety, security, and reliability of existing weapon designs but could not be used for experimenting with new weapons designs.³⁰¹

Without nuclear tests, China faced technical difficulty to improve the safety and security of the warheads. China probably did not have the financial and technical capability to launch a nuclear stockpile stewardship program similarly to the Stockpile Stewardship and Management Program (SSMP) in the United States or the PALEN (Préparation à la limitation des essais nucléaires; Preparation for the Limitation of Nuclear Testing) program in France.³⁰² Such programs were extremely expensive. The National Ignition Facility alone, for instance, was a multi-billion-dollar project.³⁰³ Given China's rapid decrease in national defense spending in the 1980s and early 1990s, China most likely was able to only retain a relatively small technical competency base.³⁰⁴

²⁹⁹ Guang (谢光) Xie and Danhuai (陈丹淮) Chen, *China's Science and Technology in National Defense* (当代中国的国防科技事业), vol. 1 (Contemporary China Publishing House (当代中国出版社), 1992).

³⁰⁰ Shen, "Likely Impact of the Policy of Clinton Administration on China's Nuclear Test (克林顿政府对中国核试验可能产生的影响)."

³⁰¹ Zhan (吴展) Wu, "Some Thoughts on Nuclear Arms Control," in *Conference on South Asia Arms Control* (Shanghai March 1994).

³⁰² Catherine Kelleher and Judith Reppy, *Getting to Zero: The Path to Nuclear Disarmament* (Stanford University Press, 2011); Robert S Norris, "French and Chinese Nuclear Weapon Testing," *Security Dialogue* 27, no. 1 (1996).

³⁰³ David Kramer, "National Ignition Facility Faces an Uncertain Future," *Physics Today* 66, no. 6 (2013).

³⁰⁴ Sun, *Implications of a Comprehensive Test Ban for China's Security Policy*.

It is not only much more expensive but also much more technically challenging to maintain the safety and security of nuclear weapons only in labs without actual testing.³⁰⁵ The United States already possessed much more advanced computer simulation technology by the 1990s than China did.³⁰⁶ After signing the CTBT, the Chinese military continued to float suggestions that the United States provide some help with simulation technology because, among the P-5, China was the only one that did not have such technology. Some U.S. weapons designers also doubted that China could develop sophisticated warhead designs using simulation technology alone.³⁰⁷ In addition, China did not have enough testing data to support computer simulation, which was also very much problematic for China.³⁰⁸ Just as one Chinese nuclear weapon scientist put it, “[W]ithout an extensive SSMP-like program, China would be at more of a disadvantage in a post-CTBT era. A CTBT would seem to not only freeze the gap between China and other nuclear states, but very likely enlarge this gap also.”³⁰⁹

Other Uncertainties and Risks

China faced other uncertainties and risks that were beyond its control. Even though the Clinton administration was supportive of a nuclear test ban, China was not sure that future U.S. administrations would follow this policy. Liu Huaqiu, one Chinese delegate at the CTBT negotiations, raised the concern that “as a token, the CTB will bring nuclear testing to a halt, but one cannot take for granted that a CTB will automatically bring

³⁰⁵Du and Hu, "Nuclear Arms Control and Physics (核军备控制与物理学)."

³⁰⁶Zhan (吴展) Wu, "The Comprehensive Nuclear Test Ban (关于全面禁止核试验的问题)," *American Studies (美国研究)*, no. 03 (1998).

³⁰⁷Johnston, *Social States: China in International Institutions, 1980-2000*.

³⁰⁸Ling (王玲) Wang, "Why Was the United States Actively Promoting Nuclear Test Ban (美国为何积极推动核禁试)," *World Knowledge (世界知识)* 15(1993).

³⁰⁹Sun, *Implications of a Comprehensive Test Ban for China's Security Policy*.

efforts to develop and modernize nuclear weapons to a stop. The CTB in itself does not address this issue. Halting development and modernization is a much different—and more difficult—matter. ... Within the context of a test ban, what is important is the political intention of complying with the treaty.”³¹⁰

The “political intention” of the United States, for instance, was difficult for China to predict. In the 1994 midterm elections, a large number of anti-CTBT conservatives were elected into the U.S. Congress.³¹¹ With the gradual change in the U.S. domestic political landscape, domestic support in the United States for CTBT began to decline. In 1996, the three major national labs—LANL, LLNL, and SNL—all supported President Clinton’s decision to sign the CTBT. In 1999, just three years later, the directors of these three national labs modified their views and voiced concerns about the sustainability of U.S. nuclear stockpile without testing. As CTBT was put forward to the Senate for ratification, the director of the Sandia National Laboratory, C. Paul Robinson, testified to the Senate’s Armed Services Committee, saying, “confidence in the reliability and safety” of the nuclear deterrent would “eventually decline without nuclear testing.”³¹² The Panel to Assess the Reliability, Safety, and Security of the United States Nuclear Stockpile—established according to the Defense Authorization Act in 1999—also reported that there was “a disturbing gap between the nation’s declaratory policy that maintenance of a safe and reliable nuclear stockpile is a supreme national interest and the actions taken to

³¹⁰ Liu Huaqiu, “No-First Use and China’s Security,” *Henry L. Stimson Center Electronic Essay*.

³¹¹ Johnston, *Social States: China in International Institutions, 1980-2000*.

³¹² “Statement of C. Paul Robinson, Director, Sandia National Laboratories,” (United States Senate Committee on Armed Services, October 7, 1999).

support this policy.”³¹³ As for the issue of nuclear test readiness, the panel stated that “a policy of sustaining low levels of readiness could, in the future, tie the hands of a President faced with stockpile problems” and recommended the reduction of test readiness “to well below the Congressionally mandated one year.”³¹⁴

Moralistic Trust?

Despite China’s willingness to accept significant national security risks, Chinese experts’ interpretation of U.S. motivation for promoting CTBT was very much in line with *realpolitik* thinking and did not recognize moral/normative consideration as part of U.S. motivation. Chinese experts believed that one of the main U.S. motivations behind CTBT was the relative decline of the importance of nuclear weapons in overall U.S. national defense as a result of U.S. “military strategic adjustment.” After the collapse of the Soviet Union, regional military threats surpassed global military threats to become the main national security threats for the United States. U.S. nuclear weapons had little role to play in dealing with such regional threats and U.S. conventional military capability would be more useful under this new security environment. This, coupled with the fact that additional nuclear tests would generate rapidly decreasing marginal benefits, gave the United States little interest in continuing nuclear tests.³¹⁵

From the Chinese perspective, another main U.S. motivation was also the changed security threats faced by the United States. By the early 1990s, nuclear proliferation became a top security concern for the United States. Nonproliferation received

³¹³Harold M. Agnew et al., "FY 2000 Report to Congress of the Panel to Assess the Reliability, Safety, and Security of the United States Nuclear Stockpile," (2001).

³¹⁴*Ibid.*

³¹⁵Ling (王玲) Wang, "The United States Promotes Comprehensive Nuclear Test Ban (美国推动全面禁止核试验)," *Contemporary International Relations* (现代国际关系) 8(1993).

unprecedented priority in the U.S. government, and the United States was determined to prevent the emergence of any new nuclear-armed state. The CTBT was primarily used by the United States as a means to achieve nonproliferation goals. In order to win the support of nonnuclear weapons states on the issue of nonproliferation, the United States had to compromise on the issue of nuclear disarmament and to end its own nuclear tests.³¹⁶

In addition, the U.S. promotion of CTBT was generally interpreted by Chinese experts as aimed at reinforcing U.S. nuclear superiority and freezing the gap between the United States and other countries in terms of nuclear technology and capability—China in particular. The United States had a superior nuclear striking capability and a much bigger and much more advanced nuclear stockpile than most countries. The United States had accumulated enough technical experience and capability to carry on maintaining its nuclear stockpile without resorting to nuclear tests, whereas for China and other nuclear weapons states, CTBT would significantly tie their hands and make it extremely difficult for them to catch up with the United States.³¹⁷

In addition, the lessons that China drew from the outcome of the CTBT negotiations were also very much in line with *realpolitik* thinking: the embrace of principles of self-help and power politics was very visible. During the CTBT negotiations, China failed to

³¹⁶Hui (窦晖) Dou and Rongrong (刘蓉蓉) Liu, "Commentary on U.S.' Nuclear Policy (评美国的核政策)," *Peace and Development (和平与发展)* 3(1996); Wang, "Why Was the United States Actively Promoting Nuclear Test Ban (美国为何积极推动核禁试)."

³¹⁷Peizhi (谢培智) Xie, "In Order to Maintain Nuclear Deterrence Capability under Comprehensive Test Ban Treaty, the United States Is Planning to Build a Series of Nuclear Explosion Simulation Facilities (为在全面禁止核试验条件下保持核威慑力量——美国拟新建若干核爆炸仿真试验设施)," *Modern Military (现代军事)* 9(1995); Wang, "The United States Promotes Comprehensive Nuclear Test Ban (美国推动全面禁止核试验)."; "The Situation before the Comprehensive Test Ban Treaty Opens for Signature (全面禁止核试验条约签署前的形势)," *ibid.*, no. 06 (1996).

secure a number of proposals—such as to link CTBT with NFU and negative security assurance commitment, to exclude national technical means from the verification mechanism, and to include certain verification technologies. In most cases, the United States was one of the strongest opponents to such proposals and dominated the debates at the CD. The general perception was that China did not have the leverage to push these proposals through on its own.³¹⁸ They attributed the lack of such leverage to their inferior capability and technology.

On the issue of national technical means, all the countries that already possessed advanced national technical means—such as the United States and Russia—supported incorporating NTM into CTBT verification. China, Pakistan, and India, among others who did not have the capacity, opposed that.³¹⁹ In the end, national technical means was basically accepted into the treaty. This also reinforced Chinese appreciation of material capability and technology as a source of political leverage.³²⁰

The Chinese perception of why they failed to include satellite and electromagnetic sensors into CTBT verification basically revealed the same issue. Chinese scientists believed that satellite monitoring and electromagnetic sensors would be very helpful for detecting nuclear tests and have conducted research on these issues.³²¹ But these technologies were not included in the CTBT verification mechanism in the end. One Chinese expert who served on the Chinese negotiation team late stated that “as early as

³¹⁸Hsu, "The Impact of Government Restructuring on Chinese Nuclear Arms Control and Nonproliferation Policymaking."

³¹⁹Frieman, *China, Arms Control, and Nonproliferation*.

³²⁰Zhu and Liu, "China's Achievement in International Arms Control in Spite of Difficulties and Challenges (论中国在国际军控困境和挑战中的作为)."

³²¹Zhang, Fan, and Zhou, "Some Discussion on the Fuction of Satellite Remote Sensing on Ctbt (卫星遥感在全面禁止核试验条约验证中的作用)."

1995, the Americans, believing that four techniques were enough, had decided to exclude EMP and other techniques even if they were useful.” “For the United States, the sooner this treaty was signed, the better.” Because discussing additional verification technologies would take time, whereas the United States wanted to conclude the negotiation as soon as possible, “this was the main reason the IMS failed to include the EMP technologies and satellites.” From the perspective of Chinese experts, the United States was able to dominate discussions on this issue during the negotiations because of its advanced status on the subject of satellite technology. China, on the contrary, did not possess advanced satellite technologies and did not have the experience of running an extensive satellite network, which caused the Chinese proposal to fall on deaf ears.³²²

By comparison, China had a very positive experience during the CTBT negotiations in issue areas where it was technologically competent. China had many well-trained geologists who were familiar with seismology through research on earthquake prediction. Thus, Chinese scientists participated in the CTBT Group of Scientific Experts Technical Test (GSETT) as early as 1994. This might have contributed to China’s confidence in support of seismic monitoring systems.

Norms and China’s CTBT Decision

Looking into the details of China’s domestic discussions and foreign policy behavior before and during the CTBT negotiations, I found no indication that China felt it had shared norms with the United States. To the contrary, China was primarily responding to normative demands of the developing countries. During the 1980s and early 1990s, China

³²²Hong (王洪) Wang, "Comprehensive Test Ban Treaty and Its Verification Technology (全面禁核试条约及其核查技术)," *New Era National Defense (新时代国防)*, no. 10 (2010).

tended to define international norms as the demands of the developing countries rather than those of the United States or other Western countries. Throughout the CTBT negotiations, China had always sought to identify itself with and respond to the demands of the developing countries—represented by the nonaligned countries (G-21 countries) and nonnuclear weapons states—even though China itself is a nuclear weapons state officially recognized by the Nuclear Nonproliferation Treaty.

China did have a need to continue nuclear tests in the early 1990s in order to protect its important national security interests. But as China's nuclear testing program continued during the CTBT negotiations, many of the developing countries began to show increasing disappointment with China's tests and began to call Chinese behavior an affront to the moral norms of the international community. Delegations from these countries accused China of being irresponsible, violating the "moral conscience of the international community"³²³ and offending the feelings of people in the developing world.³²⁴ Such normative accusations raised great concern for the Chinese. Even though they were still in the process of developing the second-generation nuclear warheads (miniaturized designs) and they would not be able to tell whether the warhead design was successful until the end of the last scheduled test in July 1996, they decided in 1994 to accept the CD's mandate to negotiate a treaty and decided in 1995 to sign the treaty when there was still a lot of uncertainty about the treaty's impact on China's future nuclear deterrence capability.³²⁵

³²³"Remarks by the Chilean and Argentinean Delegations," in *Conference on Disarmament, CD/1227, CD/1314*(Geneva October 13, 1993).

³²⁴Johnston, *Social States: China in International Institutions, 1980-2000*.

³²⁵*Ibid.*

China's negotiation behavior at the CD revealed the same point. During the negotiations, many nonaligned countries initially showed interest in negative security assurances and a no first use treaty.³²⁶ With the support of nonaligned countries, China attempted to link the CTBT to a prohibition on the first use of nuclear weapons and to a commitment to negative security assurances for all nonnuclear weapon states by seeking to include language in the treaty related to "no first use," the "complete prohibition and thorough destruction of nuclear weapons," and universal security assurances to nonnuclear weapon states. India, for instance, wanted a general reference to the relationship between the end of nuclear tests and nuclear disarmament and made three proposals for the total elimination of nuclear weapons within a "time-bound framework," "agreed time frame," and "time-bound process." Most nonaligned countries supported this "time-bound" nuclear disarmament initiative, whereas all the nuclear weapons states rejected it, except China.

China in fact stood by its commitment to NFU, NSA, and "time-bound" disarmament for quite a long time during the negotiations. However, as the negotiations dragged on at the CD, the nonaligned countries and nonnuclear weapons states began to be more concerned about the timely conclusion of the negotiations and there was a desire not to link the CTBT to other issues and instead to focus entirely on the prohibition of nuclear tests.³²⁷ Because of this new development, China later withdrew its proposed text on

³²⁶Lewis, "China and the Nuclear Test Ban."

³²⁷Ibid.

negative security assurances to nonnuclear weapon states and no first use of nuclear weapons by the nuclear weapons states.³²⁸

On the issue of peaceful nuclear explosion, India, Algeria, Iran, and other nonaligned countries at the beginning did not oppose China's PNE requirement. But as debates at the CD over PNE intensified, most G-21 countries had dropped their tacit support by 1996 and began to demand that all types of nuclear explosions be banned without exceptions. The Chinese delegation therefore agreed in June 1996 to temporarily ban PNEs unless international consensus changes following review conferences.³²⁹

On the issues of national technical means and on-site inspection approval procedure, China's position was completely in line with that of the nonaligned countries. With their support, China insisted on its position in spite of the extremely strong opposition from the United States and other nuclear weapons states. The United States ultimately made significant compromises on these issues.

Some scholars argued that China decided to sign the CTBT primarily because it faced significant international political pressure after the Tiananmen incident and desperately wanted to reduce its diplomatic tensions with the international community.³³⁰ This may not be an accurate assessment of Chinese thinking, however. In the aftermath of the Tiananmen incident, most of the international pressure that China faced was on human

³²⁸"Sha Zukang' Statement at the Cd Plenary Meeting," (Geneva: CD/PV.737, June 6, 1996).

³²⁹"Arms Control Reporter," (Section 608: CTBT, June 6, 1996).

³³⁰Alastair Iain Johnston et al., "China and Arms Control Institutions," *China Joins the World: Progress and Prospects* (1999).

rights issues, and most of the pressure was from the United States.³³¹ If China wanted so desperately to improve its image, China should have made concessions on human rights issues and made such concessions directly with the United States. But that did not happen. China did not carry out any significant “human rights diplomacy.” During the CTBT negotiations, there is little evidence that China was particularly concerned about U.S. opposition. To the contrary, China insisted on its positions on a number of the most important issues despite vehement U.S. opposition.

China’s official statements at the CD also reflect the considerable attention that it paid to the demands of the developing countries and its willingness to reshape its policy accordingly. When explaining Chinese attitudes toward CTBT, the Chinese negotiators at the CD always used language such as “great international trend,” “responsible world power,” and “global atmosphere” to point to the normative responsibility for China to join the CTBT.³³² When China pledged in 1990 to participate in an *ad hoc* committee on CTBT if such a committee were created at the CD, China stated, “China sympathizes with, and understands, the ardent desire of the vast number of Third World countries and other nonnuclear weapon states (NNWS) for the early realization of a complete prohibition of nuclear tests...China will take an active part in the work of the *ad hoc* committee and together with all other delegations work for the early materialization of a nuclear test ban and effective nuclear disarmament.”³³³

³³¹Shixin (焦世新) Jiao, "The Impact of American China Policy in the Course of China's Intergration into Two International Human Rights Conventions (中国融入国际人权两公约的进程与美国的对华政策)," *Fudan Journal (Social Sciences Edition)* (复旦学报: 社会科学版), no. 4 (2007).

³³²Lewis, *The Minimum Means of Reprisal: China's Search for Security in the Nuclear Age*.

³³³"Chinese Plenary Statement to the Conference on Disarmament," in *Conference on Disarmament*(Geneva July 17 1990).

When China declared on July 8, 1996, a moratorium on nuclear tests, President Jiang Zemin mentioned this moratorium on nuclear tests as “a response to the legitimate demand of the vast number of non-nuclear-weapon states.”³³⁴ This is fully in line with China’s self-identification at that time as a “permanent member of the developing countries.” Deng Xiaoping, China’s paramount leader during the late 1970s and 1990, emphasized throughout those years that “China always belongs to the Third World” and “China at present and in the future will always be (a part of) the Third World.”³³⁵ During this period, the reports of the twelfth, thirteenth, fourteenth, and fifteenth National Congress of China’s Communist Party all placed “solidarity and cooperation with developing countries as the foundation and starting point of China’s foreign policy.”³³⁶

On this point, Chinese leaders and China’s arms control experts were on the same page. As one Chinese arms control expert who participated in the CTBT negotiations noted, “[I]n international disarmament negotiations, China has always supported rational disarmament proposals initiated by Third World countries.” As for CTBT, she observed, “[F]or decades it has been a goal of the Third World countries to sign a CTBT,” and China needed to “maintain its image in the Third World countries.” After China decided to sign the treaty, “China’s image as a responsible major power is reportedly increasing.”³³⁷

³³⁴“Prc: Jiang Zemin on Early Conclusion of Nuclear Treaty,” (FBIS-CHI-131, p. 1, July 8 1996).

³³⁵Zicheng (叶自成) Ye, “Deng Xiaoping’s Third World Perspective: Inherited Principles and Idealistic Transcendence (邓小平的“第三世界观”:原则的继承与理想的超越),” *Pacific Journal (太平洋学报)*, no. 02 (1999).

³³⁶Qingmin (张清敏) Zhang, “Development of China’s Foreign Policy in Sixty Years: A Text Analysis of the Reports of the Party’s National Congress (六十年来新中国外交布局的发展——对党代会政治报告的文本文本分析),” *Foreign Affairs Review (外交评论(外交学院学报))*, no. 04 (2009).

³³⁷Zou, “China and the Ctbt Negotiations.”

Therefore, although China demonstrated a willingness to take significant risks during the CTBT negotiations, there was no indication of increased moralistic trust between China and the United States. Chinese interpretation of U.S. motivations still followed *realpolitik* thinking. The lessons China drew from the negotiation experience actually reinforced its appreciation of self-help and power politics principles. Mostly important, China defined international norms as the demands of the “developing countries,” which from the Chinese perspective conflicted with those of the United States. As a result, there was no recognition of shared norms between China and the United States coming out of their CTBT engagement. Moralistic trust did not get built.

CHAPTER THREE

LONG-TERM OPERATIONAL-LEVEL ENGAGEMENT: NUCLEAR STABILITY AND ARMS CONTROL

U.S.-Chinese engagement on CTBT took place at the early stage of systemic U.S.-Chinese operational-level engagement. Such engagement has continued from the signing of the CTBT until today. The issues discussed during these decades-long engagement programs include every dimension and aspect of nuclear arms control and strategic stability. The forms of engagement also went beyond regular dialogues and exchanges and began to include training programs and extensive visits.

Such long-term engagement helped to continue to grow the Chinese nuclear community, which came to the recognition that it needed to build a common vocabulary with its U.S. counterparts. Introduction of U.S. arms control theories, concepts, and analytical frameworks laid the foundation for narrowing the gap between U.S. and Chinese understanding of their national interests. Perception change from the bottom-up influenced Chinese interpretation of U.S. interests, as well as helped identify new common interests with the United States. Strategic trust increased as a result.

Engagement helped the Chinese nuclear community to develop a deeper and more sophisticated understanding of U.S. nuclear policy-making. However, the lessons drawn by the Chinese nuclear community were very much along the lines of *realpolitik* thinking. They became more convinced that the United States pursued *realpolitik* principles of power politics and “absolute security.” This made them less likely to recognize common

moral/normative principles with the United States. The basis for moralistic trust was undermined.

This chapter starts with a review of official U.S.-Chinese high-level dialogues on nuclear arms control and stability issues. The politically charged environment and the rarity of such high-level dialogues made it difficult to generate significant influence on the bilateral nuclear relationship. The next section provides a comprehensive discussion on U.S.-Chinese operational-level engagement programs. It analyzes the impact of such engagement on the growth of Chinese nuclear community, on the perception change within the community, and on the perception change at the top leadership level. It finds that strategic trust was increased during this process as Americans and Chinese found more and more common interests as a result of operational-level engagement. However, engagement reinforces Chinese perception of the *realpolitik* principles behind U.S. nuclear policy-making. Moralistic trust was not built.

Official High-Level Dialogue

U.S.-Chinese high-level official dialogues on arms control and nonproliferation were very limited in number and only started in 2003. Most of the discussions took place in politically charged environments and were in most cases iterations of general talking points rather than substance. In the two years following 2003, the two governments held three rounds of U.S.-China Strategic Security, Multilateral Arms Control, and Nonproliferation Dialogue at the undersecretary level. Issues including regional stability,

international arms control, counterterrorism, nonproliferation, the South Asia situation, North Korea, and the Iraqi situation were discussed.³³⁸

The United States and China also held a total of five rounds of the U.S.-China Strategic Dialogue between 2005 and 2008 at the undersecretary level. This dialogue was initiated by President George W. Bush and President Hu Jintao in November 2004 to encourage high-level talks on strategic issues, such as trade and economics, counterterrorism, and the North Korea issue.³³⁹

In 2009, President Barack Obama and President Hu Jintao agreed to establish the U.S.-China Strategic and Economic Dialogue (S&ED) to replace both the U.S.-China Strategic Dialogue and the U.S.-China Strategic Economic Dialogue. The U.S.-China Strategic Economic Dialogue was a high-level economic dialogue that held several meetings between 2006 and 2008.³⁴⁰ This new forum had both a “strategic track” and an “economic track.” The strategic track was typically led by the U.S. secretary of state and a Chinese state councilor and the economic track was led by the U.S. secretary of treasury and a Chinese vice premier. In 2011, a new Strategic Security Dialogue (SSD) was created under the strategic and economic dialogue that was headed and co-chaired by the U.S. deputy secretary of state and the Chinese executive vice foreign minister and

³³⁸“The United States and China Held Strategic Security, Multilateral Arms Control, and Nonproliferation Dialogue (中美举行战略安全、多边军控和防扩散磋商),” Ministry of Foreign Affairs, http://www.fmprc.gov.cn/mfa_chn/zyxw_602251/t66630.shtml.

³³⁹“Background Information: U.S.-China Strategic Dialogue (背景资料：中美战略对话),” Xinhua News Agency, http://news.xinhuanet.com/world/2007-06/21/content_6270059.htm.

³⁴⁰“The Second U.S.-China Strategic Economic Dialogue (第二次中美战略经济对话),” Xinhua News Agency, http://www.china.com.cn/economic/zhuanli/node_7019458.htm.

included the undersecretary of defense for policy and a deputy chief of the People's Liberation Army general staff.³⁴¹

All these high-level official dialogues were created relatively recently, starting from the early to mid-2000s, and many of the discussions were focused predominantly on economic and trade issues that were primary concerns for both countries' top leaders during the period. Foreign policy and security discussions were mostly devoted to regional security problems, such as South Asia and the Korean Peninsula, and counter-terrorism cooperation. Nuclear arms control and nonproliferation were not featured prominently in these high-level dialogues.³⁴² In contrast, U.S.-Chinese operational-level engagement on nuclear arms control issues had a much longer history and is much broader in scope and deeper in substance.

Operational-Level Engagement on Nuclear Stability and Arms Control Issues

U.S.-China Conference on Arms Control, Disarmament, and Nonproliferation

The U.S.-China Conference on Arms Control, Disarmament, and Nonproliferation was organized by the Center for Nonproliferation Studies (CNS) at the Monterey Institute of International Studies and its Chinese organizing partner was the China Institute of International Studies. The China Arms Control and Disarmament Association later took over as the Chinese co-organizer of the dialogue. This dialogue took place between 1998

³⁴¹Susan V Lawrence, "Us-China Relations: An Overview of Policy Issues," (2013).

³⁴²Xiao (卢潇) Lu, "U.S.-China Arms Control Interaction and Its Theoretical Analysis (中美在军控领域的交流及其理论分析)," *The probe (求索)*, no. 3 (2012); "The United States and China Held Strategic Security, Multilateral Arms Control, and Nonproliferation Dialogue (中美举行战略安全、多边军控和防扩散磋商)"; "Background Information: U.S.-China Strategic Dialogue (背景资料：中美战略对话)."

and 2009 and was attended by low- to mid-level American and Chinese officials, as well as experts from think tanks and academia. The primary purpose was to deepen discussions and develop a more complete understanding of the conceptual and technical issues dividing the two countries on nuclear arms control and nonproliferation.³⁴³

The Chinese participants were typically from the foreign ministry, military, defense industry, universities, and research institutes. On the American side, the participants were usually from the State Department, the Defense Department, the Department of Energy, the Arms Control and Disarmament Agency, the U.S. national labs, and several nongovernment organizations.

This two-day dialogue was usually attended by more than fifty participants from both countries. Over the course of twelve years, a total of seven conferences were held. The dialogue clearly helped to get more Chinese government organizations and nongovernment institutes involved in discussions of nuclear arms control and nonproliferation policies. The number of Chinese organizations that sent representatives to this dialogue increased over the years, and they represented an increasingly broader spectrum of Chinese government organizations and nongovernment institutes.

³⁴³"Us-China Conference on Arms Control, Disarmament and Nonproliferation," Center for Nonproliferation Studies, the Monterey Institute of International Studies <http://cns.miiis.edu/cns/projects/eanp/research/beijing/setting.htm>.

Table 10 Participating Chinese Government Organizations and Nongovernment Institutes in 1998³⁴⁴

Civilian Government Agency	The Military	Defense Industry	University and Research Institute
Ministry of Foreign Affairs	National Defense University	China Academy of Engineering Physics	China Institute for International Strategic Studies
Office of the CWC Implementation		China Academy of Launch Vehicle Technology	China Institute of International Studies
		China Aerospace Corporation	
		China Defense Science and Technology Information Center	

³⁴⁴ Data collected from the participants list of the U.S.-China Conference on Arms Control, Disarmament and Nonproliferation in 1998.

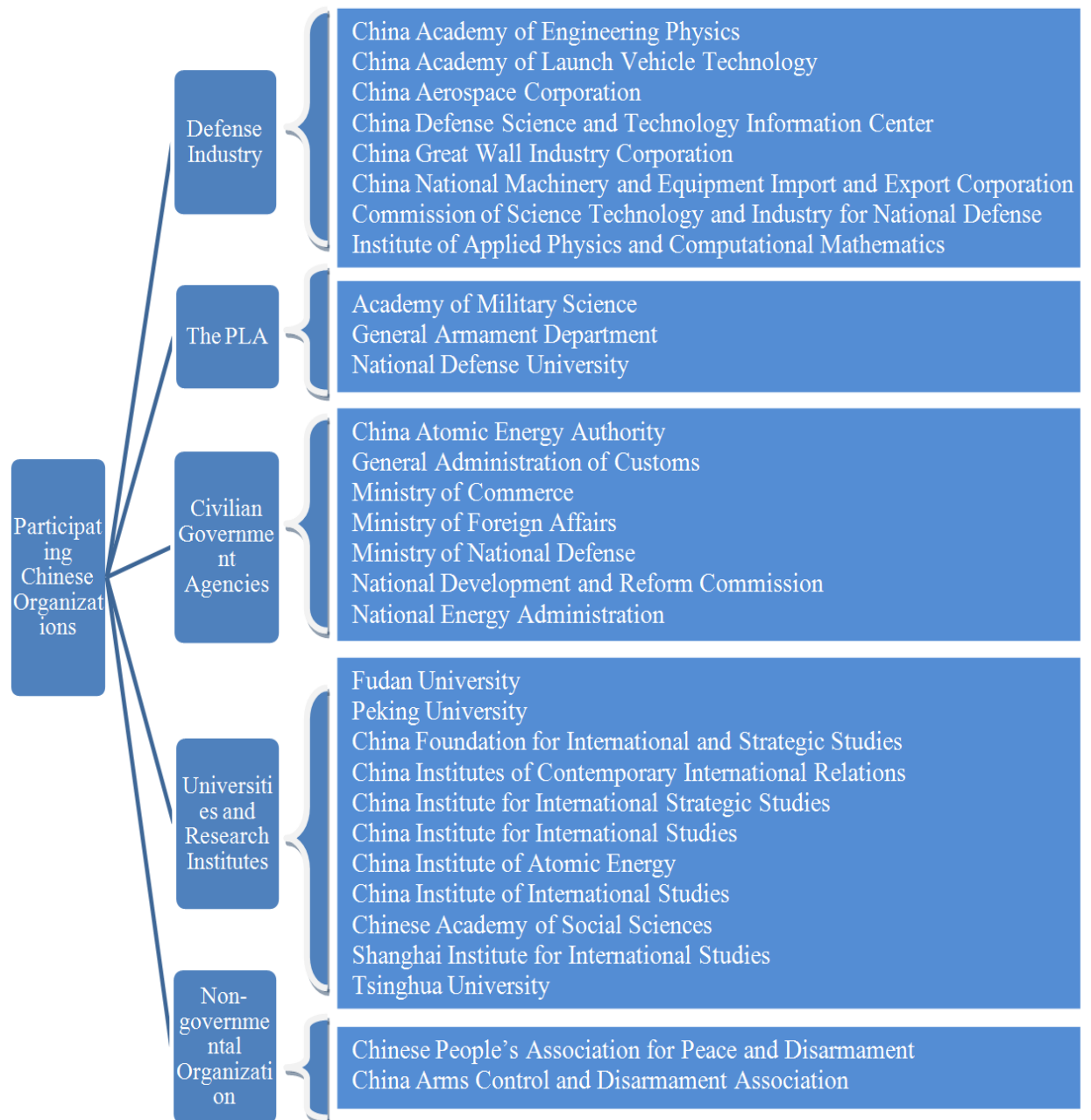


Figure 6 Participating Chinese Government Organizations and Nongovernment Institutes by 2009³⁴⁵

³⁴⁵ Data collected from the participants lists of the U.S.-China Conference on Arms Control, Disarmament and Nonproliferation from 1998 and 2009.

As Table 10 and Figure 6 show, in 1998, within China's entire civilian government bureaucracy, only the Ministry of Foreign Affairs and the Office of the CWC Implementation sent representatives to the dialogue. By 2009, however, representatives from the Ministry of National Defense, the Ministry of Foreign Affairs, the Ministry of Commerce, the National Energy Administration, the National Development and Reform Commission, the General Administration of Customs, the China Atomic Energy Authority, and the Office of the CWC Implementation became frequent participants of this dialogue.

There is a similar trend as well for organizations as part of the PLA, the defense industry, universities, and research institutes. In addition, a couple of nongovernmental organizations became frequently involved in China's nuclear arms control and nonproliferation policy discussions at the meetings. Discussions at these meetings also became increasingly deeper and more substantive. At the beginning, the discussions usually centered on general understandings about the overall international disarmament situation, the role of nuclear weapons, views about NPT, etc.³⁴⁶ In later meetings, participants began to conduct more in-depth exchanges on a much broader array of topics. At the 2002 meeting, for example, participants discussed in detail not only the concept of strategic stability but also its policy implications.³⁴⁷ Both American and Chinese experts made presentations on defining and contrasting U.S. and Chinese views on the conceptual basis of strategic stability. They also examined the impact of September 11, missile

³⁴⁶"Summary of Conference Proceedings: Us-China Conference on Arms Control, Disarmament and Nonproliferation," Center for Nonproliferation Studies, the Monterey Institute of International Studies <http://cns.miis.edu/cns/projects/eanp/research/beijing/setting.htm>.

³⁴⁷Evan S. Medeiros and Phillip C. Saunders, "Fourth U.S.-China Conference on Arms Control, Disarmament and Nonproliferation: "Building a Global Strategic Framework for the 21st Century,"" (Washington, D.C.: East Asia Nonproliferation Program, Center for Nonproliferation Studies, Monterey Institute of International Studies March 4-5, 2002).

defense, and the Anti-Ballistic Missile treaty on strategic stability. In 2006, participants held an extensive discussion about the Six-Party Talks and future security mechanisms on the Korean Peninsula. They also discussed how to more effectively build mutual confidence through strategic dialogues in the future.³⁴⁸ In 2009, discussions began to cover technical issues such as the benefits and problems with peaceful use of nuclear energy and specific nuclear nonproliferation issues prior to the 2010 NPT Review Conference.³⁴⁹ For example, the multilateral approach to containing the proliferation risks inherent in the spread of nuclear energy received heated discussion by participants. They also addressed issues related to possible Chinese admission into the Missile Technology Control Regime.

Conference on U.S.-China Strategic Nuclear Dynamics

The Conference on U.S.-China Strategic Nuclear Dynamics has been jointly organized by the Center for Strategic and International Studies (CSIS), the Institute for Defense Analyses (IDA), the RAND Corporation, and the China Foundation for International and Strategic Studies (CFISS) since 2000. A total of seven meetings had been organized by 2013. This series of meetings and conferences has been funded by the U.S. Defense Threat Reduction Agency (DTRA) and the Department of State and aims at serving as an

³⁴⁸Stephanie C. Lieggi, "Sixth U.S.-China Conference on Arms Control, Disarmament and Nonproliferation: "U.S.-China Nonproliferation Cooperation,""(Washington, D.C.: East Asia Nonproliferation Program, Center for Nonproliferation Studies, Monterey Institute of International Studies 5-6 June 2006).

³⁴⁹"Seventh U.S.-China Conference on Arms Control, Disarmament and Nonproliferation,"(Beijing: East Asia Nonproliferation Program, Center for Nonproliferation Studies, Monterey Institute of International Studies December 16-17, 2009).

unofficial but authoritative channel for discussing sensitive issues related to nuclear weapons and strategic stability in U.S.-China relations.³⁵⁰

The U.S. participants usually include former and current government officials and American experts who have a deep background in U.S. and Chinese nuclear strategy. They usually come from the State Department, U.S. Strategic Command, U.S. Pacific Command, the Defense Threat Reduction Agency (DTRA), the Department of Energy, National Defense University, University of California, the Institute for Defense Analyses, the RAND Corporation, and the Center for Strategic and International Studies. The Chinese delegation usually includes government officials, military officers, and independent experts from the National Defense University, the Academy of Military Sciences, the General Staff Department, the Second Artillery, the Ministry of Foreign Affairs, the Chinese Academy of Engineering Physics, the Institute for Applied Physics and Computational Mathematics, China Institutes of Contemporary International Relations, China Arms Control and Disarmament Association, and Tsinghua University.³⁵¹

As one of the recently established U.S.-Chinese operational-level engagement programs, this dialogue is able to build on the basis of previous dialogues and exchanges and conduct discussions on specific issues related to nuclear arms control and nonproliferation. Issues such as factors motivating nuclear modernization, challenges of nuclear terrorism, nuclear reassurance between the United States and China,

³⁵⁰"Conference on U.S.-China Strategic Nuclear Dynamics," (Beijing, China: Center for Strategic and International Studies (CSIS), the Institute for Defense Analyses (IDA), the RAND Corporation, and the China Foundation for International & Strategic Studies (CFISS), June 20-21, 2006).

³⁵¹"Conference Report on 'U.S.-China Strategic Nuclear Dynamics'," (Beijing, China: Center for Strategic and International Studies (CSIS), the Institute for Defense Analyses (IDA), the RAND Corporation, and the China Foundation for International & Strategic Studies (CFISS), June 9-10, 2008).

preconditions for no first use commitment, cross-domain deterrence, nuclear weapons and crisis management, and the future of P-5 nuclear arms control received a lot of attention and extensive discussions during these exchanges.³⁵² Both American and Chinese participants perceived these discussions as very useful for fleshing out each other's concerns and narrowing the gap between their considerations. They were able to reach agreement on issues such as crisis management coordination, the P-5 framework on nuclear arms control, and improving each other's understanding on nuclear signaling.³⁵³

New concepts such as mutual strategic restraint were proposed and explored at these meetings. Occasionally, special workshops were held that were devoted to specific topics to facilitate more in-depth discussions. In 2013, for instance, a working session on "US-China Mutual Strategic Reassurance" was organized immediately before the plenary meeting.³⁵⁴

U.S.-China Strategic Dialogue

The U.S.-China Strategic Dialogue was funded by the Advanced Systems and Concepts Office of the Defense Threat Reduction Agency and organized by the Center for Contemporary Conflict, U.S. Naval Postgraduate School, and the Pacific Forum of the Center for Strategic and International Studies. The Chinese co-host is the China Arms Control and Disarmament Association. The dialogue is held on an annual or biennial basis in Hawaii.

³⁵²Ibid.; Cossa, Glosserman, and Santoro, "Progress Continues, but Disagreements Remain: The Seventh China-US Strategic Dialogue on Strategic Nuclear Dynamics & the Inaugural China-US Dialogue on Space Security."; "Conference on U.S.-China Strategic Nuclear Dynamics."

³⁵³"Progress Continues, but Disagreements Remain: The Seventh China-US Strategic Dialogue on Strategic Nuclear Dynamics & the Inaugural China-US Dialogue on Space Security."

³⁵⁴ Such special workshops were usually held separate from the plenary meetings and were attended by a portion of the plenary meeting participants.

This dialogue brings together Chinese and U.S. strategic experts in their personal capacities to discuss the role of nuclear weapons in U.S.-China relations. The aim of the discussions is to minimize mutual misunderstanding and identify practical steps for promoting bilateral cooperation. The American participants comprise scholars, experts, former government officials, and military officers. The Chinese participants usually include a mix of active-duty military officers, retired officers, think tank researchers, and academic scholars.³⁵⁵

This dialogue is able to take advantage of the growing Chinese nuclear community that previous dialogues and exchanges had helped to build and to conduct deep and substantive discussions on nuclear-related security issues. Many of participants are seasoned Chinese nuclear experts who have participated in previous dialogues. Since its first meeting, the dialogue facilitated a series of discussions that focused on Chinese and American threat perception, U.S. alliance and extended deterrence in East Asia, military operational concepts for nuclear weapons, nuclear weapons safety and security, crisis escalation in theory and history, etc.³⁵⁶ In recent meetings, nuclear transparency and reassurance, nuclear doctrine, and regional strategic stability, among other topics, were discussed. As a result of such discussion, Chinese participants recognized the intrinsic

³⁵⁵Michael Glosny, Christopher Twomey, and Ryan Jacobs, "U.S.-China Strategic Dialogue, Phase Vii Report," (Hawaii: U.S. Naval Postgraduate School (NPS), Center on Contemporary Conflict (CCC), Project on Advanced Systems and Concepts for Countering WMD (PASCC), May 2013); Eben Lindsey, Michael Glosny, and Christopher Twomey, "U.S.-China Strategic Dialogue, Phase Vi Report," (Honolulu, Hawaii: U.S. Naval Postgraduate School (NPS), Center on Contemporary Conflict (CCC), Project on Advanced Systems and Concepts for Countering WMD (PASCC), June 2011); Christopher Twomey, Peter R. Lavoy, and Elizabeth L. Stone, "U.S.-China Strategic Dialogue, Phase I Report," (Honolulu, Hawaii: U.S. Naval Postgraduate School (NPS), Center on Contemporary Conflict (CCC), Project on Advanced Systems and Concepts for Countering WMD (PASCC), August 1-3, 2005).

³⁵⁶Christopher Twomey and Kali Shelor, "U.S.-China Strategic Dialogue, Phase Ii Report," (Honolulu, Hawaii: U.S. Naval Postgraduate School (NPS), Center on Contemporary Conflict (CCC), Project on Advanced Systems and Concepts for Countering WMD (PASCC), November 5-7, 2006); Twomey, Lavoy, and Stone, "U.S.-China Strategic Dialogue, Phase I Report."

linkage between space, cyber, and the nuclear domains. They displayed an emerging awareness that attacks on space or cyber assets could be very escalatory. They developed a positive view about separate transparency and confidence-building measures and expressed support for negotiated structured verification measures.³⁵⁷

The U.S.-China Strategic Dialogue is also the first dialogue that devotes significant time to jointly defining and discussing specific nuclear-related terms and concepts. During a number of meetings, American and Chinese participants were divided into a few breakout groups, each of which was responsible for clarifying the specific meanings of a few nuclear-related terms and concepts in American and Chinese linguistic, cultural, and military backgrounds. Much of the effort was focused on terms and concepts that are used in American and/or Chinese nuclear doctrines and policies, such as “nuclear threshold,” “counter-coercion,” “key point counterattack,” “inadvertent escalation,” “effective and reliable deterrence,” “lean and effective,” “cross domain deterrence,” “war control,” “air-sea battle,” etc.³⁵⁸ After the breakout sessions, each breakout group would report back to the entire group on the findings they reached on these terms and concepts. Such practice has helped the two sides close the gap between their understandings about each other’s nuclear thinking, strategy, doctrine, and practice.

For instance, in the meeting in June 2012, American and Chinese participants had an extensive exchange on “nuclear signaling.” The traditional Chinese view was that only formal and official statements by the government constitute nuclear signals. During this

³⁵⁷Glosny, Twomey, and Jacobs, "U.S.-China Strategic Dialogue, Phase Vii Report."

³⁵⁸Michael Glosny and Christopher Twomey, "U.S.-China Strategic Dialogue, Phase V Report,"(Honolulu, Hawaii: U.S. Naval Postgraduate School (NPS), Center on Contemporary Conflict (CCC), Project on Advanced Systems and Concepts for Countering WMD (PASCC), MAY 2010); Lindsey, Glosny, and Twomey, "U.S.-China Strategic Dialogue, Phase Vi Report."; Glosny, Twomey, and Jacobs, "U.S.-China Strategic Dialogue, Phase Vii Report."

discussion, Chinese participants recognized that in practice there might be other forms of nuclear signals such as nuclear tests and raising of alert levels. This has brought Chinese understanding more in line with American thinking on nuclear signaling. Chinese participants also acknowledged that China used to engaging in “passive and reactive nuclear signaling.” These signals were meant to “demonstrate the reliable capability of counter strike” by “improving the survivability and strengthening of the nuclear arsenal and successful tests.” In other words, the Chinese tended to emphasize the negative and coercive connotation of nuclear signaling. By contrast, Americans explained that signaling is not inherently coercive and can act as a potential method of escalation deterrence. They raised the experience of U.S.-Soviet efforts to engender transparent nuclear signaling through dialogues and arms control and cited the example of U.S.-Russian mutual ballistic missile launch notification. Toward the end of the discussion, Chinese experts acknowledged that they had not previously considered this more positive and constructive aspect of signaling. They noticed that the American view of signaling as an assurance mechanism is something that China can learn from and suggested that signaling can serve as a confidence and security-building mechanism to de-escalate during a crisis.³⁵⁹

Training and Exchange Programs

Besides regular short-term dialogues and meetings, a number of U.S. universities and nongovernmental organizations started in the 1990s to provide Chinese nuclear scientists and arms control experts with opportunities to stay for an extensive period in some of the most established research institutes to conduct scholarly exchanges and undertake policy-

³⁵⁹“U.S.-China Strategic Dialogue, Phase VII Report.”

oriented research. Stanford University, Princeton University, and MIT, among others, were the first to start engagement programs with Chinese experts.

Stanford University

Stanford University's Center for International Security and Arms Control (known as the Center for International Security and Cooperation since 1998) has focused from the very beginning on the study of arms control, nonproliferation, and the technical aspects of international security issues, particularly in the context of U.S.-Soviet-China relationships. In 1983, CISAC received a grant from Carnegie Corporation of New York to bring mid-career scientists to Stanford University to work on international security issues. Since then, CISAC has hosted a large number of Chinese scientists and policy experts at the center to conduct research and academic exchanges on issues related to nuclear arms control. Many of China's nuclear scientists and arms control experts spent extensive periods of time at CISAC. CISAC opened a door for Chinese nuclear experts to get in touch and have in-depth interaction with their American colleagues—an opportunity that was nonexistent before. Many of these experts became more devoted to nuclear arms control issues as a result of such extensive exchanges. The research conducted by these Chinese experts during their time at CISAC became some of the most cited works in the field.³⁶⁰

³⁶⁰ For example, Zou, "China and the Ctbtc Negotiations."; Sun, *Implications of a Comprehensive Test Ban for China's Security Policy*.

Princeton University

The Program on Science and Global Security (SGS) was previously part of the Center for Energy and Environmental Studies (CEES) at Princeton University and later moved to Princeton's Woodrow Wilson School of Public and International Affairs. The SGS has been providing training opportunities to postdoctoral and senior scientists interested in science and international security and has trained technical nuclear arms control and nonproliferation specialists from China and other countries. Frank von Hippel, the co-director of the program from 1974 to 2006 has played a very important role in getting Chinese nuclear scientists trained at Princeton and helping them set up similar programs after they return to their home institutes in China. Some of China's most prominent nuclear arms control experts, such as Li Bin, Shen Dingli, and Zhang Hui, all started their career in this field by spending one or two years at the program and getting familiar with the field of science and arms control, which was very much new to Chinese experts at that time. Zhang Hui conducted research on using commercial observation satellites to verify uranium enrichment gaseous diffusion plants and the application of commercial observation satellite imagery for the verification of declared and undeclared plutonium production reactors when he was in Princeton.³⁶¹ Similarly, Shen Dingli conducted research on the status of Chinese nuclear forces and nuclear policies.³⁶² All of these were some of the earliest research conducted by Chinese specialists on nuclear arms control-related topics.

³⁶¹Hui Zhang and Frank von Hippel, "The Application of Commercial Observation Satellite Imagery for the Verification of Declared and Undeclared Plutonium Production Reactors," in *CEES Report No. 319*(Center for Energy and Environmental Studies); "Using Commercial Observation Satellites to Verify That Uranium - Enrichment Gaseos Diffusion Plants Are Not Operating," in *CEES Report No. 325*(Center for Energy and Environmental Studies).

³⁶²Shen, "The Current Status of Chinese Nuclear Forces and Nuclear Policies."

SGS also publishes the leading international journal on science and arms control—*Science & Global Security*. It publishes not only in English but in Chinese and has therefore played a role in informing, educating, and raising interests among the Chinese arms control community and has opened up a valuable window of communication for the Chinese community to interact with colleagues around the world. The number of research articles written by Chinese arms control experts and published in *Science & Global Security* has increased considerably since the mid 1990s.³⁶³

Other Programs

There are parallel programs at other U.S. universities and think tanks. MIT's Defense and Arms Control Studies Program (now the Security Studies Program) provided similar training opportunities for Chinese scientists and security policy analysts. MIT professor Theodore Postol has brought in a number of Chinese scientists to work with him on missile defense and nuclear arms control issues. This provided Chinese analysts with deeper understanding of the U.S. debates around missile defense and helped them to conduct independent analysis on the impact of missile defense on global and regional stability. Li Bin, for example, conducted extensive research on issues related to ballistic missile defense, the impact of theater missile defense, and its implication on the Anti-Ballistic Missile Treaty and the Missile Technology Control Regime.³⁶⁴

³⁶³"Science & Global Security Archive," Taylor & Francis, <http://scienceandglobalsecurity.org/archive/>.

³⁶⁴Li Bin, "Nuclear Missile Delivery Capabilities in Emerging Nuclear States," *Science & Global Security* 6, no. 3 (1997); Bin Li, "Anti-Theater Missile Technology Transfer and Missile Technology Control Regime (反战区导弹技术转让与《导弹技术控制体制》)" (paper presented at the Nuclear Nonproliferation Workshop (核不扩散研讨会), Beijing, November 15 1997); "Ballistics Missile Defense and the Missile Technology Control Regime" (paper presented at the VIII International Castiglione Conference "New Challenges in the Spread of Weapons of Mass Destruction," Castiglione, Italy, September 23th - 26th, 1999).

The Stimson Center also played a very active role in training and facilitating the professionalization of the Chinese nuclear arms control community. As part of their Visiting Fellows Program, they invited midcareer Chinese analysts to visit and work on nuclear arms control and international security. Michael Krepon, cofounder of the Stimson Center has done a lot of work to connect Chinese scientists and experts with their American colleagues. Many of these Chinese visiting fellows were governmental officials, researchers, scholars, and military officers. They were provided with opportunities to visit U.S. government agencies, congressional committees, research institutes, and other nongovernmental organizations.

Developing Common Vocabulary

During these dialogues and exchange programs, it became clear to both the Americans and Chinese that “beyond the never-simple translation of one language into the other, there was also the difficulty of differing interpretations of terms.”³⁶⁵ They realized that as bilateral engagement on nuclear arms control and nonproliferation broadened and deepened, it was really important that dialogue participants whose native languages are not the same can agree to the meanings of relevant terms in Chinese and English.

Before the endeavor to clarify terminologies, dialogue participants always found themselves in situations in which they misunderstood what the other side meant and talked past each other because there was significant disagreement on the meaning of the terms they used. Such misunderstanding of terms was common, including even some of the most frequently used ones such as arms control, disarmament, deterrence, strategic

³⁶⁵“English-Chinese, Chinese-English Nuclear Security Glossary,” (Washington DC: Committee on the U.S.-Chinese Glossary of Nuclear Security Terms, National Research Council, 2008).

stability, and strategic nuclear weapons.³⁶⁶ Recognizing the importance of building a common vocabulary for effective community and the reduction of misunderstandings, American and Chinese experts made tremendous efforts to get agreement on a glossary of nuclear terms. In 2002, experts from the Nuclear Threat Initiative and the Monterey Institute on International Studies created an English-Chinese nuclear terms dictionary that includes more than 1,000 terms and has been updated in following years.³⁶⁷

In 2006, as part of the Chinese Scientists Group on Arms Control and U.S. National Academy of Sciences Dialogue, the Committee on International Security and Arms Control of the U.S. National Academy of Sciences and the Chinese Scientists Group on Arms Control of the Chinese People's Association for Peace and Disarmament started a project to jointly develop an unclassified glossary of terms on nuclear arms control, nonproliferation, and security. After extensive exchanges and two joint meetings in Beijing over a couple of years between 2006 and 2007, a list of terms, definitions, and references was finalized and the English-Chinese, Chinese-English Nuclear Security Glossary was subsequently published by the U.S. National Academy of Sciences in 2008.³⁶⁸

This glossary, which has approximately 1,000 terms, is “intended to reduce the likelihood of misunderstanding, and to remove barriers to progress in exchanges and diplomatic, cooperative, or other activities where unambiguous understanding is essential.”³⁶⁹ During the joint development process, American and Chinese experts found a large number of

³⁶⁶Personal correspondence with U.S. and Chinese dialogue participants, 2008, 2010.

³⁶⁷"English-Chinese Glossary of Wmd Terms," Nuclear Threat Initiative, <http://www.nti.org/analysis/articles/english-chinese-glossary-wmd-terms/>.

³⁶⁸"English-Chinese, Chinese-English Nuclear Security Glossary."

³⁶⁹Ibid.

cases in which there was a single meaning for one term in one language, but several different meanings for the same term that are quite distinct in the other language. There are also many cases in which one term has many different meanings even within a single language. The process of developing this glossary became in and of itself a process of cooperative clarification of some of the important policy issues.

For example, during this joint project, some American experts discovered that the term “limited deterrence” was used in some Chinese military publications. They believed that this suggests that China embraces the same meaning of this term as in the American literature, which refers to using preemptive or retaliatory nuclear strikes against enemy military targets to achieve victory on the battlefield through “counterforce” targeting. The Chinese experts disagreed and pointed out that the U.S. definition of the term does not accurately describe the Chinese nuclear strategy. Rather, the Chinese meaning of the term emphasizes the development of a very moderate and limited nuclear capability for deterrence purposes as opposed to referring to obtaining war-fight capabilities or winning nuclear wars on the battlefield.³⁷⁰ Similarly, the Americans and Chinese did not share the same definition of “strategic nuclear weapons.” The Americans refer to those nuclear weapons that are designed to engage targets in geographically remote regimes (over 5,500 kilometers) to accomplish strategic missions.³⁷¹ Whereas the Chinese regard all their nuclear weapons—regardless of the range or potential targets to engage—as

³⁷⁰³⁷⁰Kulacki, "Chickens Talking with Ducks: The Us-Chinese Nuclear Dialogue."; "English-Chinese Glossary of Wmd Terms."

³⁷¹³⁷¹"Nato English and Russian Nuclear Terms," (North Atlantic Treaty Organization, 2007).

strategic nuclear weapons.³⁷² Such differences were identified and clearly delineated in this joint glossary.

As a matter of fact, the creation of this bilingual nuclear glossary is not only a product of almost two years of discussions and back-and-forth between American and Chinese experts but is rather built upon the foundation of about twenty regular dialogues and exchanges during which substantive and detailed discussions on these nuclear issues took place.³⁷³

Community Expansion and Capacity Building

With funding and intellectual help from American organizations, China's nuclear community quickly expanded. Dr. Li Bin, who spent two years working as a postdoctoral fellow at Princeton University and MIT on science and nuclear arms control, established Tsinghua University's science and arms control program. With funding from the Ford Foundation, the Ploughshares Fund, and the MacArthur Foundation, Dr. Li organized a series of Tsinghua Arms Control Summer Symposia from 2002 through 2008. This was China's first comprehensive training program that was specifically devoted to arms control and nonproliferation issues. The East Asia Nonproliferation Project of the Center for Nonproliferation Studies at the Monterey Institute of International Studies and the Union of Concerned Scientists were co-organizers of these training programs and had played a very important role in sending experts as instructors for the training.

³⁷²"China's National Defense in 2002 (2002 年中国的国防)," The Information Office of the State Council of the People's Republic of China (中华人民共和国国务院新闻办公室), http://www.gov.cn/gongbao/content/2001/content_61220.htm.

³⁷³"English-Chinese Glossary of Wmd Terms."

The goals of the summer symposium were to provide training and education on arms control and nonproliferation issues to junior Chinese professionals, to promote interests in the study of arms control and nonproliferation issues in China, and to strengthen ties between individuals and organizations in China's arms control community. These summer symposia were usually attended by thirty-five to fifty researchers, analysts, junior officials, military officers, and journalists. All the major government agencies and military organizations that dealt with arms control and nonproliferation issues had their representatives at one or multiple symposia. There were also a large number of young researchers from many think tanks, research institutes, and universities that had not conducted arms control or nonproliferation research by that time but began to set up such programs or projects or to offer new courses on arms control and nonproliferation at their home institutes after they returned from the summer symposia. In fact, the summer symposia had been so successful and had raised so much interest in both civilian and military colleges/universities that Tsinghua held a special program in the winter of 2008 to train professors, lecturers, and researchers from a total of nearly thirty universities across the country on arms control and nonproliferation teaching and education.³⁷⁴

Similar training and educational programs have also been developed, with substantial help from the United States in many cases. Fudan University, Tongji University, Beijing University, and the Chinese Academy of Social Sciences, among many others, have opened research centers and training programs that focus on nuclear arms control issues. Many of China's government agencies including the military and the nuclear defense

³⁷⁴"The Sixth Tsinghua Arms Control Symposium - Subject: Arms Control Education (第六届清华大学军备控制研讨会, 主题: 军备控制教学)," (Beijing, China: Arms Control Program, Institute of International Studies, Tsinghua University, December 13-15, 2008).

industry have a large number of their officials and staffs trained in these programs and have gradually established formal units or organizations that are devoted to nuclear arms control issues. Chinese think tanks and nongovernment organizations have also developed increasing interest in these issues and set up research centers. Table 11 summarizes existing Chinese government and nongovernment programs/organizations that have a heavy focus on nuclear arms control issues.

Table 11 Existing Chinese Government and Nongovernment Programs/Organizations that Have A Heavy Focus on Nuclear Arms Control Issues

Program/Organization	Hosting/Managing Organization
Program on Science and National Security Studies	CAEP/IAPCM
Arms Control Physics Division	IAPCM
Department of Arms Control and Disarmament	CDSTIC, PLA General Armament Department ³⁷⁵
Department of Arms Control and Disarmament	Ministry of Foreign Affairs
Science and Technology Committee	PLA General Armament Department
“703” Arms Control Group ³⁷⁶	PLA General Staff Department
International Cooperation Department	State Administration for Science, Technology and Industry for National Defense
Arms Control Research Group	China Aerospace Science and Technology Corporation (CASC); China Aerospace Machinery and Electronics Corporation (CAMEC) ³⁷⁷
Arms Control Research Group	Chinese Academy of Sciences
Institute for International Strategic Studies	Central Party School
Academy of Military Sciences	Central Military Commission
China Institute of International Strategic Studies	The PLA General Staff Department
China Arms Control and Disarmament Association	Ministry of Foreign Affairs
China Institute of International Studies	Ministry of Foreign Affairs
Center for Peace and Development Studies	China Association for International Friendly Contact
China Foundation for International Strategic Studies	The PLA General Staff Department
China Institutes of Contemporary International Relations	Ministry of State Security
Foreign Affairs College	Ministry of Foreign Affairs
Arms Control and Nonproliferation Research Center	Chinese Academy of Social Sciences
Institute of Strategic Studies	National Defense University, Central Military Commission
Chinese Scientists Group on Arms Control (CSGAC)	Chinese People’s Association for Peace and Disarmament
Second Artillery Command College	The Second Artillery Corps
Second Artillery Engineering College	The Second Artillery Corps

³⁷⁵Gill and Mulvenon, "Chinese Military-Related Think Tanks and Research Institutions."

³⁷⁶Harlan W Jencks, "Costind Is Dead, Long Live Costind!: Restructuring China’s Defense Scientific Technical and Industrial Sector," *The People’s Liberation Army in the Information Age. The first quote is on* (1999).

³⁷⁷Ganxiang (伍赣湘) Wu, "Nuclear Arms Control (核军备控制)," *Missiles And Space Vehicles (导弹与航天运载技术)*, no. 02 (1995).

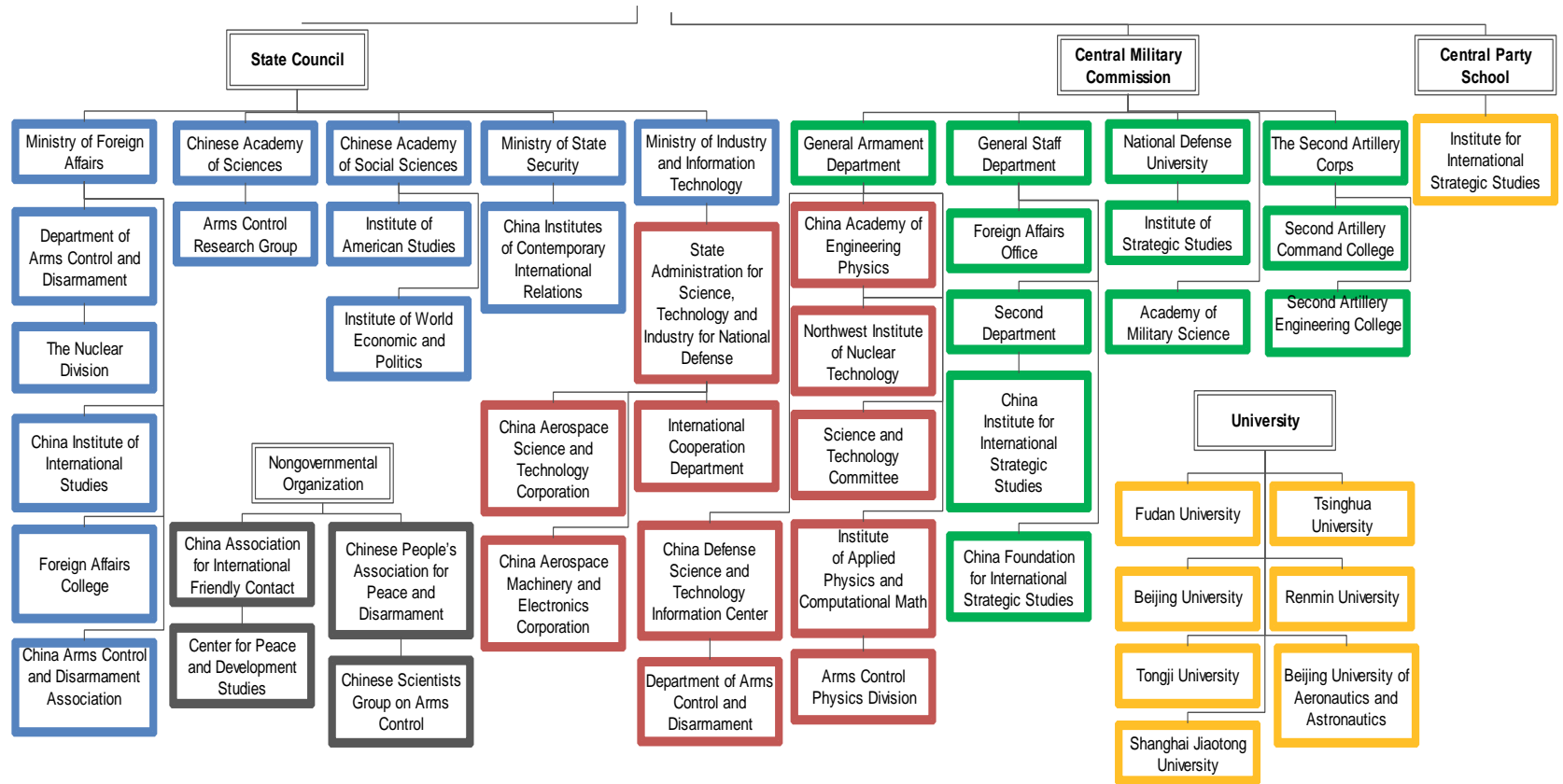


Figure 7 China's Nuclear Arms Control Organization Chart, by 2013

Figure 7 shows the expansion of China's nuclear arms control organizations within the entire Chinese bureaucracy. As discussed in Chapter 2, at the beginning of U.S.-Chinese nuclear engagement, there were only an extremely limited number of organizations that occasionally dealt with nuclear arms control policy including the Fourth Division of the International Organizations Department of the Foreign Ministry and the Second Department of the PLA General Staff Department (see Figure 3). By 2013, however, Chinese nuclear arms control organizations have increased dramatically. In Figure 7, boxes with blue borders are civilian organizations under the administration of the State Council; boxes with green borders are military organizations; boxes with red borders are organizations of the defense industry; boxes with yellow borders are research centers in universities; and boxes with black borders are nongovernmental organizations.

The growth of China's nuclear community contributes to the breaking of traditional compartmentalization of the bureaucracy. As missile defense became the subject of discussion at some U.S.-Chinese nuclear dialogues, some Chinese scientists from the aerospace industry were brought into those discussions. There also emerged an internal debate on missile defense among Chinese scientists and experts since the 1980s.

Scientists within the Ministry of Aerospace Industry began to be involved in arms control research. A scientists' research group called the Arms Control Research Group was set up within the Ministry of Aerospace Industry. Nuclear arms control and deep reductions were part of their research work. They held an annual ten-day meeting to present research

papers and have discussions. They also served as informal consultants to the Ministry of Foreign Affairs.³⁷⁸

Some of the think tanks and nongovernmental organizations have been organizing nationwide policy workshops and seminars. The Arms Control and Nonproliferation Research Center of the Chinese Academy of Social Sciences, for example, has hosted a number of workshops on “Arms Control and Sino-U.S. Relations,” “Annual Arms Control Situation,” “Current Arms Control Situation,” “U.S. Arms Control and Nonproliferation Policy,” etc.³⁷⁹ The China Arms Control and Disarmament Association has also hosted a large number of conferences and meetings on arms control situation analysis and arms control policy coordination. They publish an annual report on international arms control and disarmament (年度国际军备控制与裁军), with contributors from senior officials and experts from the Foreign Ministry, the PLA, the nuclear defense industry, and think tanks. In addition, professional journals that are specifically devoted to arms control issues establish another channel for communication and coordination across the system. Examples include the Arms Control and Security (军备控制与安全) and Research and Progress in Arms Control (军备控制研究与进展).

The unprecedented, large number of government organizations that have formal subunits working on nuclear arms control issues has influenced China’s official nuclear policy-making. Even those think tanks and nongovernmental organizations in Figure 7 have also

³⁷⁸Medeiros, *Reluctant Restraint: The Evolution of China's Nonproliferation Policies and Practices, 1980-2004*.

³⁷⁹Jishe (樊吉社) Fan, "Summary of the Workshop on Arms Control and U.S.-China Relations (军控与中美关系研讨会综述)," *American Studies (美国研究)*, no. 02 (1999); "A Summary of the Symposium on the Present Situation of Arms Control (军控形势研讨会综述)," *American Studies (美国研究)*, no. 01 (2000); "Summary of American Arms Control and Nonproliferation Policy Workshop (“美国军控与防扩散政策研讨会” 综述)," *American Studies (美国研究)*, no. 2 (2010).

developed close ties with relevant government agencies and have various communication channels for their voices to be heard at the top level. For instance, the China Foundation for International Strategic Studies can submit reports to the Politburo Standing Committee, and the Academy of Military Science coordinates and channels the submission of reports from the General Staff Department, China Institute of International Strategic Studies, National Defense University, and the General Armament Department to the General Office of the Central Military Commission, which then evaluates and summarizes them for the top leaders of the Standing Committee of the Politburo.³⁸⁰ These communication channels also serve to transfer the results of various operational U.S.-Chinese nuclear dialogues to the formal decision-making circle at higher levels. At one of the U.S.-China strategic dialogues, one Chinese participant from China Arms Control and Disarmament Association emphasized that these Track II and Track 1.5 dialogues are valued in Beijing and feed into the official process in China through Ministry of Foreign Affairs and Ministry of National Defense.³⁸¹

Operational-Level Engagement and China's Development of Its Nuclear Strategy

After China obtained a rudimentary military nuclear capability in the mid-1960s, China did not have a nuclear strategy for a long time. What China had during the following decades were what it called "nuclear policies." The best-known example is the unconditional No First Use (NFU) policy which China committed itself to immediately after its first nuclear explosion in October 1964. This policy was directly imposed by China's top leadership in an effort to distinguish China's moral principle of never using

³⁸⁰ Ming Zhang, *China's Changing Nuclear Posture: Reactions to the South Asian Nuclear Tests* (Brookings Inst Press, 1999).

³⁸¹ Glosny, Twomey, and Jacobs, "U.S.-China Strategic Dialogue, Phase VII Report."

nuclear weapons to threaten any other countries as long as they did not conduct the first nuclear strike on China. There was not much military consideration behind the announcement of the NFU policy by China's top leadership at that time and the adoption of this policy was primarily a result of political decisions.³⁸²

The NFU policy, along with the policy to support the "complete prohibition and thorough destruction of nuclear weapons"—another key element of China's "nuclear policies"—was based on the Chinese top leaders' understanding of nuclear weapons and nuclear wars.³⁸³ The adoption of these policies by the top leadership was mainly used to "reveal the nature of its nuclear strategy as defensive" and to demonstrate China's political stand against nuclear wars.³⁸⁴ For a long time, these "nuclear policies" were the principles of China's nuclear operation and practice. China's first and second paramount leaders—Mao Zedong and Deng Xiaoping—both took a very active role in imposing these political principles to China's nuclear policy, making themselves the ultimate authority in guiding the development of China's nuclear policy.³⁸⁵

³⁸²Yi (刘毅) Liu and Zhenjiang (刘镇江) Liu, "Mao Zedong's Nuclear Ethical Thought and Its Epochal Value (论毛泽东核伦理思想及其时代价值)," *Journal of University of South China(Social Science Edition)* (南华大学学报(社会科学版)) 10, no. 5 (2009); Jingguo (潘敬国) Pan, "Zhou Enlai and the Formation of China's Nuclear Diplomacy Strategy (周恩来与中国核外交战略的形成)," in *Third National History Annual Convention of the Institute of Contemporary China Paper Collections* (当代中国研究所第三届国史学术年会论文集)(2003); Jiayu (张家裕) Zhang, "An Analysis of the Nuclear Strategic Thinking of Mao Zedong and Zhou Enlai (试论毛泽东、周恩来的核战略思想)," *Military History Research* (军事历史研究), no. 02 (1989).

³⁸³Sun Xiangli, "Analysis of China's Nuclear Strategy," *China Security* 1, no. 1 (2005); "Statement by the Chinese Delegation on the Issue of Nuclear Disarmament and Reduction of the Risks of Nuclear War at the Third Session of the Preparatory Committee for the 2010 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons," (New YorkMay 2009).

³⁸⁴"Analysis of China's Nuclear Strategy."

³⁸⁵Zou, "Deng Xiaoping's Nuclear Strategy Thinking (邓小平的核战略思想)."; Cai, "An Analysis of Deng Xiaoping's Nuclear Strategic Thinking (论邓小平的核战略思想)."; Wang, "Factors Behind the Evolution of China' Nuclear Strategy During the Mao Zedong and Deng Xiaoping Era (毛泽东与邓小平时代的中国核战略演进动因分析)."

In comparison, the operational-level players throughout China's government bureaucracy—including the PLA, the military defense industry, the foreign ministry, and think tanks—did not contribute to China's nuclear policy-making. There was no systematic thinking about the role of nuclear weapons, what could and should be achieved through the possession of a nuclear weapons capability, under which scenarios China's nuclear weapons should be used (except not to be the first to use nuclear weapons), and what should be the ideal size and configuration of China's nuclear stockpile for the purpose of maximizing China's security interests. All the operational-level players were essentially executors of China's "nuclear policy," which was limited to a few political principles and was dictated by the top leadership. China's nuclear scientists from the nuclear defense industry, for example, were influential in the development of China's nuclear forces in the sense that they made decisions on China's nuclear and missile procurement plans by interpreting the requirements suggested by Mao's and Deng's ideas about nuclear weapons and their nuclear principles.³⁸⁶ But they did not contribute to the nuclear policymaking, which was considered the sole responsibility of the top leadership.³⁸⁷

This was the same for the PLA. The PLA set up a special strategic rocket force—the Second Artillery Corps—on July 1, 1966, two years after China's first atomic explosion. Since then, the Second Artillery became the backbone of China's nuclear forces,

³⁸⁶ John Wilson Lewis and Litai Xue, *China Builds the Bomb* (Stanford, CA: Stanford University Press, 1988); *China's Strategic Seapower: The Politics of Force Modernization in the Nuclear Age* (Stanford University Press, 1996).

³⁸⁷ M Taylor Fravel and Evan S Medeiros, "China's Search for Assured Retaliation: The Evolution of Chinese Nuclear Strategy and Force Structure," *International Security* 35, no. 2 (2010).

operating all of China's land-based ballistic missiles.³⁸⁸ The Second Artillery, however, did not contribute to China's nuclear policy-making for a long time, either. Its task was to execute orders in the form of managing and operating China's nuclear forces. It did not even have much of an influence in determining force requirements, which was decided by the nuclear scientists based on their interpretation of the top leaders' nuclear principles.³⁸⁹

During the 1960s and 1970s, the Second Artillery conducted limited research on civil defense and conventional operations under a nuclear scenario.³⁹⁰ Throughout the 1980s, when it came to the issue of China's nuclear strategy, the Second Artillery's role was limited to the development of operational regulations and guidance for the nuclear forces. In the early 1980s, for instance, the Second Artillery held a couple of operational application research meetings, during which they discussed the Second Artillery's operational guiding principles, principles of operations and battlefield construction, etc.³⁹¹ The Second Artillery's publications focused on operational principles and regulations. Even the most well-known documents, such as "The Science of Second Artillery Campaigns" and "The Science of Military Strategy"³⁹² were operational texts

³⁸⁸Shilun (宋时轮) Song and Ke (萧克) Xiao, *Chinese Encyclopedia of Military Affairs* (《中国军事百科全书》), vol. 1(Beijing: Military Science Press (军事科学出版社), 1997).

³⁸⁹Lewis and Xue, *China's Strategic Seapower: The Politics of Force Modernization in the Nuclear Age; China Builds the Bomb*.

³⁹⁰Fravel and Medeiros, "China's Search for Assured Retaliation: The Evolution of Chinese Nuclear Strategy and Force Structure."; Jianying (叶剑英) Ye, *Selected Military Writings of Ye Jianying* (《叶剑英军事文选》)(Beijing: The PLA Press (解放军出版社), 1997).

³⁹¹*Selected Military Writings of Ye Jianying* (《叶剑英军事文选》).

³⁹²Rui (高锐) Gao, *The Science of Military Strategy* (《战略学》)(Beijing: Military Science Press (军事科学出版社), 1987).

that were based on interpretations of Mao's and Deng's views about the utility and purpose of nuclear weapons.³⁹³

Beginning in the 1990s, however, as Chinese researchers and experts began to communicate and interact with their American and other foreign colleagues, they gradually came to the recognition that China did not have a nuclear strategy. Western analysts, particularly American analysts, began to study China's nuclear strategy in the 1970s. The study conducted by Alice Langley Hsieh on Communist China's strategy in the nuclear era was one of the early studies.³⁹⁴ John Lewis and LitaiXue's book *China Builds the Bomb* was one of the most widely cited works on China's nuclear weapons development and policy. At the same time, Chinese American scholar Chong-Pin Lin wrote the book *China's Nuclear Weapons Strategy: Tradition within Evolution*.³⁹⁵ All these works were read and followed by Chinese experts and analysts. Some were translated and published in Chinese and instigated a lot of discussion in China.³⁹⁶ Chinese experts in most cases found these foreign studies informative as a detailed chronicle of China's nuclear weapons program, although they also disagreed with many of the conclusions regarding Chinese nuclear thinking behind the weapon program.³⁹⁷ Most

³⁹³Fravel and Medeiros, "China's Search for Assured Retaliation: The Evolution of Chinese Nuclear Strategy and Force Structure."

³⁹⁴Alice Langley Hsieh, *Communist China's Strategy in the Nuclear Era*(Greenwood Press, 1976). There were a few other studies, for instance, Leo Yueh-yun Liu, *China as a Nuclear Power in World Politics*(Macmillan, 1972).

³⁹⁵Chong-Pin Lin, *China's Nuclear Weapons Strategy: Tradition within Evolution*(Lexington Books Lexington, Mass, 1988).

³⁹⁶Jifeng (刘戟锋) Liu, "Nuclear Strategy in Traditional Culture: A Review of China's Nuclear Weapons Strategy: Tradition within Evolution (传统文化中诞生的核战略——评《龙威：中国的核力量与核战略》)," *Studies In Dialectics Of Nature (自然辩证法研究)* 10, no. 08 (1994).

³⁹⁷Wenting (聂文婷) Nie, "Research Review of China's Development of Its First Atomic Bomb (中国第一颗原子弹研制的研究述评)," *Military History Research (军事历史研究)* 2(2013); Liu, "Nuclear Strategy in Traditional Culture: A Review of China's Nuclear Weapons Strategy: Tradition within Evolution (传统文化中诞生的核战略——评《龙威：中国的核力量与核战略》)."; Donghai (段东海) Duan and Qian (张倩)

importantly, Chinese analysts realized that “compared to studies about China’s nuclear weapons development, there has been little study about China’s nuclear strategy.”³⁹⁸

In 1989, He Zuoxiu, a prominent Chinese nuclear scientist and a frequent participant of U.S.-China operational-level engagements such as the Dialogue between Chinese Scientists Group on Arms Control and U.S. National Academy of Sciences, made the first open publication discussing China’s No First Use policy. He specifically mentioned the exchanges with American scientist Richard Garwin and acknowledged that China “faces the issue of how to describe its own ‘nuclear deterrence’ concept.”³⁹⁹ Since the 1990s, American analysts had an extensive debate on China’s nuclear strategy.⁴⁰⁰ During various operational-level dialogues, questions were raised by the American participants about China’s nuclear strategy.⁴⁰¹ These American experts had different interpretations of China’s nuclear strategy. Some of the terms used by them to describe Chinese nuclear strategy include “minimum deterrence,” “credible minimum deterrence,” “assured retaliation,” “minimum means of reprisal,” and “limited nuclear retaliation,” among

Zhang, "Breaking up Sino-Soviet Alliance: U.S. Strategic against China's Nuclear Development - an Analysis of Four Sino-U.S. Relationship Models During 1961-1964 (瓦解中苏同盟: 美国对中国核开发的战略——关于 1961—1964 年四组中美关系模式的分析)," *Cold War International History Studies (冷战国际史研究)* 2, no. 2.

³⁹⁸Liu, "Nuclear Strategy in Traditional Culture: A Review of China's Nuclear Weapons Strategy: Tradition within Evolution (传统文化中诞生的核战略——评《龙威: 中国的核力量与核战略》)."

³⁹⁹Zuoxiu (何祚庥) He, "On China's Nuclear Policy of Not Using Nuclear Weapons First (论中国 “不首先使用核武器” 的核战略)," *Journal of Dialectics of Nature (自然辩证法通讯)* 11, no. 1 (1989).

⁴⁰⁰See, for instance, Alastair Iain Johnston, "Prospects for Chinese Nuclear Force Modernization: Limited Deterrence Versus Multilateral Arms Control," *The China Quarterly* 146(1996); Xue Litai, "Evolution of China's Nuclear Strategy," *Strategic Views from the Second Tier: The Nuclear Weapons Policies of France, Britain, and China* (1995); Alastair Iain Johnston, "China's New" Old Thinking": The Concept of Limited Deterrence," *International Security* 20, no. 3 (1995).

⁴⁰¹Elaine Bunn, "Nuclear Deterrence - Us and Chinese Perspectives," in *US-China Conference on Arms Control, Disarmament and Nonproliferation*(Beijing, China: East Asia Nonproliferation Program, Center for Nonproliferation Studies, Monterey Institute of International Studies, 24 to 25 September, 1998).

others.⁴⁰² Some of the American understanding about China's nuclear strategy was more aggressive and ambitious than a "minimum nuclear deterrence" and suggested that China was embracing a "limited nuclear deterrence" strategy.⁴⁰³ Faced by questions raised by their American colleagues, Chinese experts and strategists began to conduct their own research on China's nuclear strategy. This was unprecedented because China's nuclear policy had always been imposed by the top leadership and had not been thoroughly examined by operational-level actors.

The first Chinese description of its own nuclear strategy was in 1992.⁴⁰⁴ Starting in the mid-1990s, some of the Chinese experts who had been frequent participants in U.S.-Chinese dialogues began conducting research on China's own nuclear strategy and nuclear arms control policy.⁴⁰⁵ Some of the studies were clearly influenced by American/Western concepts such as the relationship between nuclear de-alerting and nuclear strategy.⁴⁰⁶ Originating from the perceived need to respond to American experts and policy analysts, this internal discussion in China quickly developed into a systemic bottom-up effort to reflect on and rethink Chinese nuclear strategy. Chinese experts from

⁴⁰² Gill Bates et al., "The Chinese Second Artillery Corps: Transition to Credible Deterrence," *J., Mulvenon and AND, Yang (eds) The People's Liberation Army as Organization* (2002); Lewis, *The Minimum Means of Reprisal: China's Search for Security in the Nuclear Age*; John Wilson (约翰·刘易斯) Lewis and Litai (薛理泰) Xue, "Evolution of China's Military Strategic Guidance and Nuclear Strategy (中国军事战略方针及核战略之演变)," *The Leadership (领导者)*, no. 2 (2011); Fravel and Medeiros, "China's Search for Assured Retaliation: The Evolution of Chinese Nuclear Strategy and Force Structure."; Michael Chase and Evan Medeiros, "China's Evolving Nuclear Calculus: Modernization and the Doctrinal Debate" (paper presented at the RAND/CNAC PLA conference, Washington, DC, 2002).

⁴⁰³ Johnston, "China's New Old Thinking": The Concept of Limited Deterrence."; Johnston, "Prospects for Chinese Nuclear Force Modernization: Limited Deterrence Versus Multilateral Arms Control."

⁴⁰⁴ Cheng (姚成) Yao, "China's Nuclear Strategy and Its Features (中国的核战略及其特点)," *World Military Yearbook (世界军事年鉴)* (1992).

⁴⁰⁵ Huaqiu (刘华秋) Liu, "Analysis of China's Nuclear Arms Control Policy (中国核军控政策评析)," *Contemporary Military (现代军事)*, no. 11 (1995).

⁴⁰⁶ Zhimin (李志民) Li, "The Relations between De-Alerting Nuclear Force and Nuclear Strategy (除核力量警戒状态与核战略的关系)," *China Nuclear Science and Technology Report (中国核科技报告)* (2000).

the defense industry, the PLA, the foreign ministry, think tanks, and academia who had been involved in U.S.-Chinese dialogues were most active in leading and contributing to these discussions. Such internal operational-level discussions contributed greatly to the formation and clarification of China's modern nuclear strategy by bringing attention to the importance of developing an explicit nuclear strategy, introducing and internalizing American/Western concepts into Chinese nuclear thinking, and helping rationalize and formalize Chinese nuclear strategy. The result of this was China's gradual embrace of "deterrence."

Embracing Deterrence

Chinese top leaders had a distinct understanding of the role of nuclear weapons from that of the United States. Mao Zedong, Zhou Enlai, and Deng Xiaoping all saw nuclear weapons as essentially unusable for the purpose of warfighting. Mao Zedong, who initiated China's nuclear weapons program, spoke forthrightly about the role of nuclear weapons: "Some fools are still talking about (using) nuclear weapon, but it will never be used again. The nuclear explosion in Japan at the same time destroyed (the nuclear weapon) itself, because people all over the world are against its use."⁴⁰⁷ His emphasis on "win by striking only after the enemy had struck" was in accordance with his "tit for tat is fair play" principle.⁴⁰⁸ Deng Xiaoping, the principal of China's second-generation leaders,

⁴⁰⁷Xiong (殷雄) Yin and Xuemei (黄雪梅) Huang, *A Century's Review: A Global History of Atomic Weapons (世纪回眸: 世界原子弹风云录)*(Beijing: Xinhua Press (新华出版社), 1999).

⁴⁰⁸The literal translation of his original words is: We will not attack unless we are attacked; if we are attacked, we will counterattack for sure.

stuck to the “win by striking only after the enemy had struck” principle and emphasized the importance of “effective revenge.”⁴⁰⁹

The idea of “effective revenge,” therefore, became the most important concept in Chinese nuclear thinking. In contrast, the term “deterrence” was never part of China’s nuclear vocabulary until it was introduced by Chinese experts. As a matter of fact, the Chinese term of “deterrence” actually had quite a different meaning from the English term. This distinction did not come to the notice of the two countries’ nuclear decision makers until Chinese participants of some of the operational-level dialogues began to realize the significant difference. The English term “deterrence” has traditionally been translated into Chinese as *weishe*(威慑). However, *weishe* actually refers to using military intimidation to achieve objectives without fighting. It has a negative connotation in Chinese because it implies the use of coercive action.⁴¹⁰ Therefore, the meaning of *weishe* is much closer to the meaning of the English terms of “coercion” or “compulsion.”⁴¹¹ Because of its negative connotation, China resisted the use of “deterrence” to define its nuclear strategy. For decades, China was heavily critical of the “superpowers’ nuclear deterrence.”⁴¹² In its official documents, China emphasizes that

⁴⁰⁹Cai, "An Analysis of Deng Xiaoping's Nuclear Strategic Thinking (论邓小平的核战略思想)."; Zou, "Deng Xiaoping's Nuclear Strategy Thinking (邓小平的核战略思想)."

⁴¹⁰Riqiang (吴日强) Wu, "Issues in Sino-US Nuclear Relations: Survivability, Coercion and Escalation," in *UK-China Strategic Communication Initiative*(London: Foreign & Commonwealth Office, 2013).

⁴¹¹William Burr, "Sino-American Relations, 1969: The Sino-Soviet Border War and Steps Toward Rapprochement," *Cold War History* 1, no. 3 (2001).

⁴¹²Zhan (吴展) Wu, "Nuclear Deterrence (核威慑)," *American Studies (美国研究)*, no. 01 (1988).

“the Chinese government has always opposed to nuclear blackmail and nuclear deterrence,” and criticized the nuclear powers’ “nuclear deterrence” policy.⁴¹³

This anti-nuclear deterrence rhetoric began to change after China developed a better understanding of nuclear deterrence. Chinese nuclear scientists and analysts from government-affiliated think tanks were the first to be convinced about the neutrality of the term “nuclear deterrence” during their interaction with American scientists and experts. They were the first to use and highlight this term in their writings and analysis and introduce it to their colleagues in the foreign ministry and the military.⁴¹⁴ Since then, this term has been gradually accepted and embraced by China’s nuclear community. They are able to use and discuss nuclear deterrence through the same lens as it is used by American nuclear strategists.⁴¹⁵ More importantly, China’s nuclear community had an extensive debate about whether the American term of nuclear deterrence appropriately delineates China’s nuclear strategy and strategic thinking and generally came to the conclusion that Chinese understanding about a limited means of reprisal is very much in line with the concept of minimum nuclear deterrence.⁴¹⁶

This apparently affected China’s official nuclear policy. Even though China’s 1995 arms control white paper continued its traditional policy of opposing the superpowers’

⁴¹³“China's Arms Control and Disarmament (中国的军备控制与裁军),” (Beijing: State Council Information Office of the People's Republic of China (中华人民共和国国务院新闻办公室), 1995).

⁴¹⁴Bin (李彬) Li, “China's Nuclear Strategy (中国核战略辨析),” *World Economics and Politics (世界经济与政治)*, no. 09 (2006).

⁴¹⁵Kuaiji (孙快吉) Sun, “Analyzing China's Self-Defensive Nuclear Strategy (解读我国自卫防御核战略),” *Current Report (时事报告)*, no. 2 (2007).

⁴¹⁶Yu (荣予) Rong and Yuan (洪源) Hong, “The Evolution of China's Nuclear Strategy: From Anti-Nuclear Deterrence to Limited Deterrence (从反核威慑战略到最低核威慑战略:中国核战略演进之路),” *Journal of Contemporary Asia-Pacific Studies (当代亚太)*, no. 3 (2009); Hongzhang (王鸿章) Wang, “The Development of Nuclear Deterrence Theory in China (中国核威慑思想的历史演进),” *Military History (军事历史)*, no. 5 (2012).

“nuclear deterrence,”⁴¹⁷ the English version of its 2000 defense white paper began to use the term “deter” to describe its own nuclear strategy. Its Chinese version used the term *ezhi*(遏制), which is close to but slightly different from *weishe* (威慑).⁴¹⁸ Since 2006, however, the term “deterrence” was officially accepted and used in its defense white papers in the nuclear capability sections.⁴¹⁹

Rationalization and Conceptualization of China’s Nuclear Strategy

Chinese paramount leaders Mao and Deng personally erected a number of policy principles for China’s nuclear development and operation. But for decades, China did not have a coherent nuclear strategy. The growth and expansion of China’s nuclear community, and especially their close connection and interaction with their American colleagues, provided them the capability and opportunity to systematically examine China’s nuclear thinking and to help formulate a coherent nuclear strategy through rationalizing and formalizing the nuclear principles imposed by the top leaders. Such rationalization and formalization later was accepted by the top leadership and influenced China’s overall nuclear strategy development.

During U.S.-Chinese operational-level engagement, the issue of no first use received a lot of attention and was heavily discussed.⁴²⁰ Since the Chinese NFU commitment was a

⁴¹⁷"China's Arms Control and Disarmament (中国的军备控制与裁军)."

⁴¹⁸"China's National Defense in 2010 (2010 年中国的国防)."

⁴¹⁹"China's National Defense in 2006 (2006 年中国的国防)," The Information Office of the State Council of the People's Republic of China (中华人民共和国国务院新闻办公室), http://news.xinhuanet.com/politics/2006-12/29/content_5546076.htm.

⁴²⁰"Conference Report on 'U.S.-China Strategic Nuclear Dynamics'."; Side (胡思得) Hu and Jun (伍钧) Wu, "Join Hands toward the Goal of a Nuclear Weapon Free World (携手向无核世界的目标前进)," in *PIIC Beijing Seminar on International Security*(BeijingNovember 2012); Jianqun (滕建群) Teng, "Sino-American Nuclear Dialogue: Retrospect and Prospect (中美核领域对话的回顾与展望)," *International Studies (国际问题研究)*, no. 03 (2011); Medeiros and Saunders, "Fourth U.S.-China Conference on Arms

political principle imposed by top leaders, this commitment does not look completely rational from the *realpolitik* perspective. The credibility of China's NFU policy, as a result, was often challenged by the United States and created significant misunderstanding between the two sides. During bilateral dialogues and exchanges, however, Chinese experts who became increasingly familiar with the American nuclear literature realized that the Chinese top leaders' perception about the unusability of nuclear weapons was essentially similar to the concept of nuclear taboo in the U.S. literature.⁴²¹ They used the concept of nuclear taboo to explain to their American colleagues the perception and thinking behind China's NFU policy, which was effective in helping bridge the perceptual gap between the two sides.⁴²² By revealing the different cultural and perceptual motivations behind China's nuclear thinking, Chinese experts were also able to shed new light on issues of mutual concern such as strategic stability and help put abstract concepts into perspectives that facilitated the reduction of mutual misunderstanding. Li Bin, for instance, introduced Chinese thinking on strategic stability and adapted and broadened the original Western framework around strategic stability to include additional factors that reflect contemporary international security development.⁴²³ These exchanges also reinforced Chinese understanding and appreciation of the importance of maintaining NFU policy for a stable U.S.-Chinese

Control, Disarmament and Nonproliferation: "Building a Global Strategic Framework for the 21st Century.""

⁴²¹Xin (李欣) Li, "Li Bin: Nuclear Weapons and Nuclear Taboo (李彬: 核武器与核禁忌)," *Chinese Academy of Social Sciences Journal (中国社会科学院院报)* 2007; Bin (李彬) Li and Hongyi (聂宏毅) Nie, "A Study of Sino-U.S. Strategic Stability (中美战略稳定性的考察)," *World Economics and Politics (世界经济与政治)*, no. 02 (2008); Riqiang (吴日强) Wu, "Just War, Nuclear Taboo, and Nuclear Free World (正义战争、核禁忌与无核武器世界)," *ibid.*, no. 10 (2009).

⁴²²Barry D. Watts, "Nuclear-Conventional Firebreaks and the Nuclear Taboo," (Washington, DC: Center for Strategic and Budgetary Assessments, 2013); Li and Nie, "A Study of Sino-U.S. Strategic Stability (中美战略稳定性的考察)."

⁴²³"A Study of Sino-U.S. Strategic Stability (中美战略稳定性的考察)."

nuclear relationship. Chinese nuclear experts who have been involved in these exchanges have become the most vocal domestic supporters for China maintaining its NFU policy.⁴²⁴

The credibility of China's nuclear deterrence was another issue that was not systematically examined in China. Chinese top leaders intended to build a "lean and effective nuclear force" but did not explain what this meant in practice.⁴²⁵ This became clear only after the Chinese nuclear community adopted from the United States the concept of mutually assured retaliation and used it to understand qualitative and quantitative requirements for Chinese nuclear capability. Previously, Mao had a preliminary understanding that only a few nuclear weapons would be able to deter the United States from using nuclear weapons against China. But it was only after Chinese nuclear experts adopted the American analytical framework for understanding nuclear deterrence that they started to use concepts such as the threshold of unacceptable damage to help them understand the qualitative and quantitative requirement for Chinese nuclear force development.⁴²⁶

Drawing on the American framework, Chinese participants also conceptualized the credibility rationale behind China's nuclear development and force posture. They illustrated the role that "first-strike uncertainty" plays in China's nuclear deterrence and pointed out potential areas for China to be more transparent in its nuclear development

⁴²⁴Zhenqiang Pan, "China Insistence on No-First-Use of Nuclear Weapons " *China Security* 1, no. 1 (2005); Sun, "Features and Characteristics of China's Nuclear Strategy (中国核战略性质与特点分析)."

⁴²⁵Yiming (毕义明) Bi et al., "Research on the Quantitative Model for the Nuclear Deterrence Effectiveness (核威慑能力量化模型研究)," *Journal of Xi'an University of Engineering Science and Technology (西安工程科技学院学报)* 19, no. 2 (2005).

⁴²⁶Yiming (毕义明) Bi et al., "Research on the Quantitative Model for the Nuclear Deterrence Effectiveness (核威慑能力量化模型研究)," *Journal of Xi'an University of Engineering Science and Technology (西安工程科技学院学报)* 19, no. 2 (2005).

and operation.⁴²⁷ It is argued, for instance, as China deploys more road-mobile missiles, it does not need to rely heavily on numerical ambiguity for obtaining a high level of survivability. Instead, China can rely more on geographical ambiguity. It is also suggested that China could be more transparent about midlevel nuclear doctrines that would give outsiders a deeper understanding of the guiding principles of Chinese nuclear posture without releasing sensitive details of its nuclear operation. Such a conceptual framework was gradually adopted by the broader Chinese nuclear community and was increasingly incorporated into China's official nuclear policy deliberation and expression.⁴²⁸

Bottom-Up Communication and Influence

Initiation of Internal Debates and Policy Rethinking

Operational-level engagement played a direct role in the initiation of China's internal nuclear policy debate and rethinking. China's internal discussion on missile defense and nuclear stability is one of the examples. China's missile defense research project originally started in 1964 under the code name "640 Project" with the support from Mao Zedong. Between 1964 and 1977, when the project was terminated, the 640 Project had produced a number of missile interceptors such as Counter Strike I and Counter Strike II

⁴²⁷Bin Li, "China and Nuclear Transparency," in *Transparency in Nuclear Warheads and Materials: The Political and Technical Dimensions*, ed. Nicholas Zarimpas(Oxford: Oxford University Press, 2003); Wu Riqiang, "Certainty of Uncertainty: Nuclear Strategy with Chinese Characteristics," *Journal of Strategic Studies* 36, no. 4 (2013); Avery Goldstein, *Deterrence and Security in the 21st Century: China, Britain, France, and the Enduring Legacy of the Nuclear Revolution*(LIT Verlag Münster, 2000); Devin T Hagerty, *The Consequences of Nuclear Proliferation: Lessons from South Asia*(MIT Press, 1998).

⁴²⁸Xiangli (孙向丽) Sun, "Theories and Practice in Arms Control (军备控制的理论与实践)," *Teaching and Research (教学与研究)*, no. 6 (2001); "China's Endeavors for Arms Control, Disarmament and Non-Proliferation," (Beijing: The Information Office of China's State Council, 2005); "Nuclear Disarmament and Reduction of the Danger of Nuclear War: Working Paper Submitted by China," in *2010 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons*(New York6 May 2010).

and a series of antimissile cannons including the 640-2 and the Vanguard Cannon.⁴²⁹ But the project also encountered serious technical problems. In 1977, the project was terminated and three years later it was cancelled.

After the United States started the Strategic Defense Initiative (SDI) in 1983, however, Chinese nuclear and rocket scientists became concerned about the implications of such high-technology development for China's nuclear capability and national security in general. This development of a missile defense system by the United States, however, did not trigger the concern of China's top leaders due to the dramatically improved U.S.-Chinese relationship at that time. In 1986, prominent Chinese scientists such as Wang Daheng (王大珩), Wang Ganchang (王淦昌), Yang Jiachi (杨嘉墀), and Chen Fangyun (陈芳允), with the support of other scientists such as Zhu Guangya (朱光亚), wrote a report to Deng Xiaoping arguing that China should respond to such development in the United States and other countries by starting its own research and development programs. Restarting missile defense research was one of the key recommendations submitted by the scientists. This report was approved by Deng and kick-started one of the most important high-technology research and development investment projects in China—the 863 Project (National High Technology Research and Development Program of China).⁴³⁰

⁴²⁹ Jiadong (程加栋) Cheng and Jiaqi (张家齐) Zhang, "The Historical Development of China's Anti-Missile System (中国反导系统研发历程揭秘)," *Friends of Party Members and Cadres (党员干部之友)*, no. 3 (2010).

⁴³⁰ *Song of the Spring: Deng Xiaoping and China's Science and Technology Development (春颂: 邓小平同志与中国科技事业)*, Book Series to Commemorate the 100th Anniversary of the Birth of Deng Xiaoping (纪念邓小平同志诞辰 100 周年丛书) (Beijing: Scientific & Technological Documentation Publishing House (科学技术文献出版社)).

China's nuclear community started an internal debate about the impact of the Strategic Defense Initiative on China and how China should respond. Chinese scientists and policy analysts all participated in this debate.⁴³¹ These studies formed the foundation of China's official policy toward SDI. The research conducted by China Institute of International Studies researcher Zhang Qubing and later published in *International Studies*, for example, was used directly by China's top leadership to inform their decision making.⁴³² The Chinese Academy of Social Sciences also published an edited volume on U.S. missile defense: *Star Wars: An Analysis of the U.S.-Soviet Contention for Space*.⁴³³ After the Chinese nuclear community voiced concerns about SDI's impact on China's nuclear retaliatory capability and overall security environment, Chinese government sources began to express open criticism about SDI. On September 30, 1985, foreign minister Wu Xueqian firstly called on the United States and Soviet Union to stop from weaponizing the space.⁴³⁴ Premier Zhao Ziyang also made a speech shortly after to reiterate the same point.⁴³⁵

⁴³¹See, for example, Da (司马达) Sima, "Realities and Illusions of Star Wars (星球大战的梦幻与现实)," *World Affairs* (世界知识), no. 12 (1983); Peiyao (陈佩尧) Chen, "The Reality and Future of the 'Star Wars' (‘星球大战’的现实与未来)," *Material of International Issues* (国际问题资料), no. 05 (1983); Jian (孙俭) Sun, "The U.S. 'Star Wars' Program (美国的‘星球大战’计划)," *foreign Missile and Aerospace* (国外导弹与航天), no. 04 (1985); Quanren (赵全仁) Zhao, "A Few Basic Comments on the 'Star Wars' Program (试谈对‘星球大战’计划的几点基本看法)," *Foreign Missile and Astronautics* (国外导弹与航天), no. 01 (1986).

⁴³²Qubing (庄去病) Zhuang, "An Analysis of the U.S. 'Star Wars' Initiative (美国‘星球大战’计划剖析)," *International Studies* (国际问题研究), no. 04 (1984).

⁴³³*Star Wars: An Analysis of the U.S.-Soviet Contention for Space* (星球大战：对美苏太空争夺的剖析), (Chinese Academy of Social Sciences and the Institute of World Economics and Politics (中国社会科学院世界经济与政治研究所): PLA Publishing House (解放军出版社), 1986).

⁴³⁴Xueqian Wu, "Statement by Foreign Minister Wu Xueqian at the Fortieth Session of the United Nations General Assembly," (New York September 29 1985).

⁴³⁵Ziyang Zhao, "Statement by Zhao Ziyang at the Commemorating Meeting of the 40th Anniversary of the United Nations," (October 24 1985).

Perceptual Change

U.S.-Chinese operational-level engagement played a direct role in pressuring the young Chinese nuclear community to reflect on, rethink, and redevelop its nuclear-related policies. For a decade after the establishment of the People's Republic in 1949, China did not have a real nuclear policy (not just the lack of a clear military nuclear strategy as discussed earlier in this chapter). Chinese leaders were very comfortable with following the nuclear policy of the Soviet Union, which was then considered China's "big brother." For instance, in a 1959 standing committee meeting of the National People's Congress, foreign minister Chen Yi (陈毅) stated, "We hold that the new initiatives suggested by the Soviet government on arms control are fully in accord with the fundamental interests of the Chinese people and people of all other states in the world."⁴³⁶ Since 1949, China adopted the so-called "leaning to one side" diplomatic guidance, pledging to stand on the side of the Soviet Union in all "international struggles."⁴³⁷ On nuclear-related issues, China's official policy followed closely that of the Soviet Union, with very little exception.⁴³⁸ China supported the Soviet Union's policy on the nuclear arms race and

⁴³⁶Yixian (谢益显) Xie, *China's Diplomatic History: The Period of the People's Republic of China, 1949-1979* (中国外交史: 中华人民共和国时期, 1949-1979), vol. 3(Zhengzhou: Henan People's Press (河南人民出版社), 1988).

⁴³⁷Chengling (吴成玲) Wu, "The Establishment of the "Leaning on One Side" Diplomatic Policy from an International Perspective (国际化视阈下 "一边倒" 外交政策的确立)," *Journal of University of International Relations* (国际关系学院学报), no. 03 (2011); Caixin (万才新) Wan, "The Establishment of New China's "Leaning on One Side" Diplomatic Strategy and Its Policy Practice (新中国 "一边倒" 外交战略的确立及其实践效应)," *Socialism Studies* (社会主义研究), no. 02 (2012).

⁴³⁸Mingquan Zhu, "The Evolution of China's Nuclear Nonproliferation Policy," *The Nonproliferation Review* 4, no. 2 (1997).

offered endorsement for almost all Soviet positions during the Korean War, Second Arab-Israeli War, and Berlin Crises.⁴³⁹

After China split with the Soviet Union in the early 1960s, China went into *de facto* self-isolation and had less engagement in nuclear arms control and nonproliferation issues with other countries. When the American scientists and experts began to engage with their Chinese counterparts, Chinese participants in these dialogues and exchanges were suddenly faced with the new challenge of developing independent views on nuclear issues. The operational-level engagement at the Conference of Disarmament, starting from 1980, often put Chinese diplomats into a similarly difficult position as well. The participation of Chinese experts and diplomats in various engagement programs in and of itself created a need for China to develop and refine its nuclear policies.⁴⁴⁰ This need has also motivated Chinese participants to actively observe and learn from their American and foreign colleagues, which greatly contributed to a socialization process that changed Chinese perception on some of the most important nuclear issues in a bottom-up manner.

Accepting and Internalizing New Terms

One indicator of this bottom-up perception change is the gradual acceptance and internalization of some of the most important American/Western terms on nuclear stability and arms control. Extensive discussions and exchanges on these terms took place in many of the U.S.-Chinese nuclear dialogues, which has played a significant role in changing the Chinese perception.

⁴³⁹Shengfa (张盛发) Zhang, "Khrushchov and Berlin Crisis 1958-1961 (赫鲁晓夫与 1958~1961 年柏林危机)," *Shanghai Normal University Journal (Philosophy and Social Sciences)* (上海师范大学学报(哲学社会科学版)) 4(1993).

⁴⁴⁰Johnston, *Social States: China in International Institutions, 1980-2000*.

Strategic Stability

Strategic stability was not a new term for the Chinese. The *People's Daily*, for instance, has published commentaries and editorials that touched upon the issue of strategic stability for decades.⁴⁴¹ However, the traditional Chinese understanding of strategic stability is not completely in line with the classic American/Western definition. The Chinese have traditionally taken a much broader view of strategic stability that encompasses not only nuclear relations but also political-military relations more generally.⁴⁴² They have referred to strategic stability as a general state of balance—including security, military, alliance, and economic stability, and many other dimensions.⁴⁴³

The American understanding of strategic stability was introduced to the Chinese nuclear community through various U.S.-Chinese exchanges and the subsequent introduction of American arms control literature.⁴⁴⁴ The term “strategic stability” was extensively discussed during a number of dialogues such as the U.S.-China Conference on Arms Control, Disarmament and Nonproliferation; the Conference on U.S.-China Strategic Nuclear Dynamics; the U.S.-China Strategic Dialogue; the ISODARCO-Beijing Seminar on Arms Control; and the CSCAP Study Group on Countering the Proliferation of

⁴⁴¹Xinhua News Agency, "Nato Foreign Affairs Ministers Conference Emphasized Defense Issues - Arguing for Capabilities That Can Deter Invasion and Resist Pressure (北约外长会议强调加强防务主张保持足以遏制侵略和顶住压力的力量)," *People's Daily*, December 9 1977.

⁴⁴²Brad Roberts, "China and Ballistic Missile Defense: 1955 to 2002 and Beyond," (DTIC Document, 2003).

⁴⁴³See, for example, Jin Wang and Wensheng Li, "The Contraversies over the Two Plus Two: The Missile Defense and Strategic Weapons of the Untied States and Russia (“2+2” 的 “是非题” 美俄反导及战略武器)," *Ordnance Knowledge*, no. 5 (2008); Nengwu (徐能武) Xu, "The Threats and Challenges to Outer Space Security Posed by the Adjustment of the U.S.Strategic Deterrent System (美国战略威慑体系调整对外层空间安全的潜在威胁与挑战)," *National Defense Science & Technology*, no. 2 (2013).

⁴⁴⁴Sun and Wang, "Current Status and Future Trend of Nuclear Arms Control Research (核军备控制研究的现状与前景)."

Weapons of Mass Destruction (WMD Study Group).⁴⁴⁵ Chinese participants in these engagement programs were the first to learn and then use the American concept of strategic stability to study the U.S.-Chinese nuclear relationship. They wrote and published a relatively large number of papers to apply and promote the new analytical framework for understanding nuclear stability. These authors include experts from the nuclear defense industry,⁴⁴⁶ the military,⁴⁴⁷ the foreign ministry's research institutes,⁴⁴⁸ think tanks,⁴⁴⁹ and university research centers.⁴⁵⁰

This new understanding and analytical framework of strategic stability—including both the arms control stability and crisis stability—was increasingly used to study the security implications of new military development in the United States and other places on Chinese nuclear deterrence and regional stability.⁴⁵¹ As this concept has been accepted and embraced by a wider circle of policy and academic analysts, more Chinese experts

⁴⁴⁵ Evan S. Medeiros, "3rd Us-China Conference on Arms Control, Disarmament and Nonproliferation, Us-China Arms Control and Nonproliferation Cooperation: Progress and Prospects," (Beijing, China: East Asia Nonproliferation Program, Center for Nonproliferation Studies, Monterey Institute of International Studies September 14-15, 2000); Medeiros and Saunders, "Fourth U.S.-China Conference on Arms Control, Disarmament and Nonproliferation: "Building a Global Strategic Framework for the 21st Century.""; "Conference Report on 'U.S.-China Strategic Nuclear Dynamics'."; Carlo Schaerf, in *8th ISODARCO Beijing Seminar on: "Arms Control"* (Beijing, China 14-18, October 2002); "Conference on U.S.-China Strategic Nuclear Dynamics."; Glosny and Twomey, "U.S.-China Strategic Dialogue, Phase V Report."

⁴⁴⁶ Sun, "Theories and Practice in Arms Control (军备控制的理论与实践)."

⁴⁴⁷ Li, "A Preliminary Analysis on U.S.-China Strategic Stability: Contructing U.S.-China Strategic Stability Beyond Strategic Weapons (中美战略稳定初探——超越战略武器看中美战略稳定的构建)."

⁴⁴⁸ Dunn et al., "Building toward a Stable and Cooperative Long-Term U.S.-China Strategic Relationship (构建长期稳定、合作的中美战略关系)."

⁴⁴⁹ Xu, "The Threats and Challenges to Outer Space Security Posed by the Adjustment of the U.S. Strategic Deterrent System (美国战略威慑体系调整对外层空间安全的潜在威胁与挑战)."

⁴⁵⁰ Ting (吴挺) Wu, "Space Weaponization from the Perspective of U.S.-China Strategic Stability (从中美战略稳定性看太空武器化问题)" (Fudan University (复旦大学), 2012); Deshun (李德顺) Li, "The Mutual Independence in Strategic Stability (战略稳定性中的相互依赖因素)" (Tsinghua University (清华大学), 2012); Li and Nie, "A Study of Sino-U.S. Strategic Stability (中美战略稳定性的考察)."

⁴⁵¹ Wu Riqiang, "Survivability of China's Sea-Based Nuclear Forces," *Science & Global Security* 19, no. 2 (2011); Bin (李彬) Li and Riqiang (吴日强) Wu, "Impact of Euro-Missile Shield on Russia Security" (paper presented at the the 19th International Summer Symposium on Science and World Affairs, Oslo, Norway, July 21-30 2008); Lora Saalman, "China and the U.S. Nuclear Posture Review," (Beijing: Carnegie-Tsinghua Center for Global Policy, February 28, 2011).

used it to understand the impact of missile defense on nuclear relationships.⁴⁵² In the debates around deep nuclear reductions, they also used this concept to explore how strategic stability would change as global nuclear stockpiles continue to reduce and to derive policy recommendations.⁴⁵³ After this narrower concept of strategic stability was accepted by the Chinese nuclear community, it began to be embraced by the official Chinese rhetoric. Starting in the late 2000s, Chinese official statements and documents began to refer to strategic stability in the same manner.⁴⁵⁴

The Chinese nuclear community not only played an important role in internalizing the American concept of strategic stability that was then accepted by government officials, it also managed to reach a common understanding with its American colleagues on the importance of maintaining strategic stability in the U.S.-Chinese nuclear relationship.⁴⁵⁵ This common understanding has become the foundation of official U.S.-Chinese interaction on nuclear arms control and nonproliferation issues. China's traditional position had always put the "complete prohibition and thorough destruction of nuclear weapons" as the ultimate goal of its nuclear policy but was not able to connect this

⁴⁵²Hongbo (李洪波) Li and Yan (周艳) Zhou, "Indian Missile Defense Plan and South Asia Regional Security (印度导弹防御计划与南亚地区安全)," *South Asia Studies (南亚研究)*, no. 4 (2009); Huaqiu (刘华秋) Liu, "International Arms Control Faces New Challenges - 'Arms Control and Disarmament Handbook' Editor Interviews (国际军备控制面临新的挑战——《军备控制与裁军手册》主编访谈录)," *Modern Military (现代军事)*, no. 5 (2001).

⁴⁵³Nengwu (徐能武) Xu and Saimei (金赛美) Jin, "The Practicality of the Construction of a Nuclear Free World (推进无核世界建设的现实性分析)," *Contemporary World (当代世界)*, no. 1 (2010); Li, "The Mutual Independence in Strategic Stability (战略稳定性中的相互依赖因素)."; Bin (李彬) Li and Tiefeng (肖铁峰) Xiao, "Rethinking the Role of Nuclear Weapons (重审核武器的作用)," *Foreign Affairs Review (外交评论)* 3(2010).

⁴⁵⁴"Nuclear Disarmament and Reduction of the Danger of Nuclear War: Working Paper Submitted by China."; "Nuclear Disarmament and Reduction of the Danger of Nuclear War: Working Paper Submitted by China," in *Preparatory Committee for the 2015 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, NPT/CONF.2015/PC.I/WP.40*(Vienna27 April 2012).

⁴⁵⁵Thomasingar and Fan Jishe, "Ties That Bind: Strategic Stability in the Us-China Relationship," *The Washington Quarterly* 36, no. 4 (2013).

idealistic goal with policy realities.⁴⁵⁶ It was concerned that participating in nuclear arms control talks would not only run counter to its ultimate objective but also undermine its own security interests in the process.⁴⁵⁷ For this reason, the Chinese government has been reluctant to officially commit itself to participating in nuclear arms control talks. At the operational-level, however, after years of discussions, the Chinese and American nuclear communities were able to reach a common understanding that bilateral strategic stability based on de facto mutually assured destruction (MAD) is a helpful starting point for building the bilateral nuclear relationship.⁴⁵⁸ For political reasons, the two governments could not openly support a bilateral nuclear relationship based on MAD and mutual vulnerability. The United States does not want to openly admit it is vulnerable to a Chinese second nuclear strike, and China does not like the Cold War–era term of mutually assured destruction, which implies a Cold War–type U.S.-Chinese rivalry. But the common understanding reached between the Chinese and American nuclear communities made it possible for the two governments to build on this tacit agreement and to initiate substantive talks on practical policy issues.⁴⁵⁹

Escalation Control and Crisis Stability

Crisis management or escalation control was not focused by China's traditional security thinking. Ancient Chinese military thinking did not touch upon the issue of

⁴⁵⁶"China's National Defense in 2000 (2000 年中国的国防)," The Information Office of the State Council of the People's Republic of China (中华人民共和国国务院新闻办公室), http://www.gov.cn/gongbao/content/2001/content_61220.htm.

⁴⁵⁷Xinyue (王欣月) Wang, "The Idea and Reality of a World Free of Nuclear Weapons (无核世界的构想与现实)" (East China Normal University (华东师范大学), 2010).

⁴⁵⁸Medeiros and Saunders, "Fourth U.S.-China Conference on Arms Control, Disarmament and Nonproliferation: "Building a Global Strategic Framework for the 21st Century.""

⁴⁵⁹Personal correspondence with American and Chinese participants of the U.S.-China Strategic Dialogue, 2012.

crisis/escalation management. During China's revolutionary years under Mao, China's security policy emphasized the importance of using tactics to confuse the enemy by creating the utmost uncertainty in the enemy's mind. The purpose was to understand the enemy as much as possible but to keep the enemy from obtaining an accurate understanding of oneself.⁴⁶⁰ This was very close to the so-called brinkmanship strategy and was completely opposite the emphasis paid by the Western literature on reducing the fog of war.

Chinese political and military leaders consistently expressed the view that military actions should only be taken when there is absolute certainty (or near-absolute certainty) of winning. Among the three principles for fighting enemies stressed by Mao, one was about when to employ military power: "The second is the winning principle. We either do not fight them; or if we do choose to go into a fight, we must win. We should never fight a war for which we are not very well prepared and which we do not have full confidence of winning."⁴⁶¹ Because of this principle of not fighting a war that China may not win, Chinese strategists devoted relatively little thinking to how to deal with scenarios other than complete victory or defeat.

Under the leadership of Mao and Deng, there was a very clear line between the role of nuclear weapons and the role of conventional weapons in Chinese military doctrine and policy deliberation. Nuclear weapons were regarded only as a "strategic deterrent," for deterring nuclear wars. Nuclear weapons were not intended and, as they believed, less

⁴⁶⁰Zedong (毛泽东) Mao, *Selected Military Works of Mao Zedong (毛泽东军事文选)*(People's Liberation Army Soldiers Publishing House (中国人民解放军战士出版社), 1981).

⁴⁶¹Jisi (王缉思) Wang and Hui Xu (徐辉), "An Comparative Analysis of Sino-U.S. Crisis Behavior (中美危机行为比较分析)," *America Studies (美国研究)*, no. 2 (2005).

useful to deter other types of wars, including large-scale conventional wars and regional conflicts.⁴⁶² They believed that mass mobilization (a people's war) was more effective in deterring large-scale conventional invasion, and rapid-response conventional forces were more effective at deterring regional conflicts.⁴⁶³

In addition, China did not traditionally focus on drawing lessons from past crises. Before the 1980s, Chinese discussion focused on how most crises stemmed from domestic struggles rather than international problems. Crises were regarded as opportunities to advance one's own interests.⁴⁶⁴ After China obtained a nuclear capability in the mid-1960s, China had little real experience of being directly involved in nuclear crises, with a brief exception in 1969 when the Soviets were reported to have made an implicit threat of conducting a surgical strike against China's rudimentary nuclear capability.⁴⁶⁵ In contrast, the United States and the Soviet Union underwent a number of serious nuclear crises, not the least among which was the Cuban missile crisis. Such nuclear crises between the United States and the Soviet Union taught them firsthand lessons about the real dangers of inadvertent escalation, and China had very limited such experience in comparison.

⁴⁶²Qiong (吴琼) Wu, "An Exploration of China's Military Deterrent Thinking in the New Era (我国新时期军事威慑思想浅探)," *Military History Research (军事历史研究)*, no. 2 (2002).

⁴⁶³Zhengling (袁正领) Yuan, "The Thoughts and Practice of Conventional Deterrence after the Founding of Prc (论新中国建立后常规威慑思想与实践)," *Military History (军事历史)*, no. 1 (2002).

⁴⁶⁴Davis B Bobrow, Steve Chan, and John A Kringen, *Understanding Foreign Policy Decisions: The Chinese Case*(Free Press New York, 1979).

⁴⁶⁵Yi (雨驿) Yu, "Sino-Soviet Nuclear Crisis Caused by Zhenbao Island (由珍宝岛引发的中苏核战危机)," *Friends of Party Members and Cadres (党员干部之友)*, no. 12 (2009); Hao (陈昊) Chen, "Zhou Enlai before and after the Zhen Bao Islands Clashes (周恩来在珍宝岛事件前后)," *Extensive Collection of the Party History (党史博采(纪实))*, no. 1 (2010); Burr, "Sino-American Relations, 1969: The Sino-Soviet Border War and Steps Toward Rapprochement."

Moreover, the traditional Chinese view was that discussing the issue of crisis/escalation control in and of itself sends a signal of weakness.⁴⁶⁶ Never making compromise with the enemy was regarded as a sacred principle and a key quality of a decision maker. China's appreciation of the dangers of inadvertent escalation of crisis was by and large established during long-term U.S.-Chinese interaction at the operational-level. Since the United States has been very much concerned about crisis stability in a potential U.S.-Chinese confrontation, American participants devoted significant attention to include discussions of crisis stability and escalation management in various U.S.-Chinese dialogues and exchanges. In many of these meetings, there were extensive discussions on terms and issues related to "escalation control," "inadvertent escalation," "crisis stability," and "nuclear threshold."⁴⁶⁷

Gradually, the gap between American and Chinese understanding about escalation control narrowed. Chinese participants began to see value in preventing escalation of war from the conventional to the nuclear level.⁴⁶⁸ Specific escalation scenarios across the Taiwan Strait were mostly discussed during these exchanges, but as the conversation went broader and deeper,⁴⁶⁹ more scenarios such as those on the Korean Peninsula, in the South China Sea, and in South Asia were also discussed.⁴⁷⁰ Chinese participants started to appreciate the risk of inadvertent escalation if signals were miscommunicated.⁴⁷¹ They

⁴⁶⁶Tuosheng (张沱生) Zhang, "Zhang Tuosheng Discusses the Establishment of the State Security Committee (张沱生谈设立国家安全委员会全球性大国要拼危机管控)," *National Culture History (国家人文历史)*, no. 24 (2013).

⁴⁶⁷Glosny and Twomey, "U.S.-China Strategic Dialogue, Phase V Report."

⁴⁶⁸Ibid.

⁴⁶⁹Twomey and Shelor, "U.S.-China Strategic Dialogue, Phase II Report."

⁴⁷⁰Ibid.; Glosny, Twomey, and Jacobs, "U.S.-China Strategic Dialogue, Phase VII Report."; Cossa, Glosserman, and Santoro, "Progress Continues, but Disagreements Remain: The Seventh China-US Strategic Dialogue on Strategic Nuclear Dynamics & the Inaugural China-US Dialogue on Space Security."

⁴⁷¹Lindsey, Glosny, and Twomey, "U.S.-China Strategic Dialogue, Phase VI Report."

even began to urge the United States and China to make crisis management a priority, seeking mutual understanding of each other's key operational principles, and stress that both countries must establish bilateral crisis management mechanisms to improve communication both before and during a crisis.⁴⁷² They started to argue for the importance of direct communication.⁴⁷³

As the discussions continued, Chinese participants were increasingly open and willing to discuss more sophisticated issues related to crisis/escalation management. On several occasions, the issue of cross-domain escalation was discussed, and Chinese participants expressed the view that they actually believed such conversations were long overdue.⁴⁷⁴ Escalation control discussions expanded from the nuclear-only scenarios to include additional domains such as space, air, and cyber. Taiwan no longer preoccupied Chinese participants' attention and interests. They recognized the possibility that military tensions in other theaters might very well spillover and affect Taiwan.⁴⁷⁵ They also actively argued for the two countries to establish "rules of the road" to manage potential crises.⁴⁷⁶

The same trend appeared in the publications of the Chinese nuclear community. They increasingly accepted American scholars' concepts and used their works to draw lessons for China's nuclear policy. They introduced and applied concepts, such as Thomas

⁴⁷²Cossa, Glosserman, and Santoro, "Progress Continues, but Disagreements Remain: The Seventh China-US Strategic Dialogue on Strategic Nuclear Dynamics & the Inaugural China-US Dialogue on Space Security."

⁴⁷³Christopher Twomey and Kali Shelor, "U.S.-China Strategic Dialogue, Phase Iii: "The Role of National Perceptions of Security Environments in Shaping Sino-American Nuclear Affairs,""(Honolulu, Hawaii: The U.S. Naval Postgraduate School and Pacific Forum-Csis, November 4-6, 2007).

⁴⁷⁴Cossa, Glosserman, and Santoro, "Progress Continues, but Disagreements Remain: The Seventh China-US Strategic Dialogue on Strategic Nuclear Dynamics & the Inaugural China-US Dialogue on Space Security."; Glosny, Twomey, and Jacobs, "U.S.-China Strategic Dialogue, Phase Vii Report."

⁴⁷⁵Cossa, Glosserman, and Santoro, "Progress Continues, but Disagreements Remain: The Seventh China-US Strategic Dialogue on Strategic Nuclear Dynamics & the Inaugural China-US Dialogue on Space Security."

⁴⁷⁶Ibid.

Schelling's "threat that leaves something to chance," Robert Jervis's slippery slope from conventional to nuclear war, and Glen Snyder's stability/instability paradox to Chinese scenarios.⁴⁷⁷ Experts such as Wang Jisi and Xu Hui proposed practical steps for China to take in order to better understand and manage crises.⁴⁷⁸ Figure 8 also shows the increasing number of journal articles written by Chinese experts on the subject of crisis/escalation control/management.

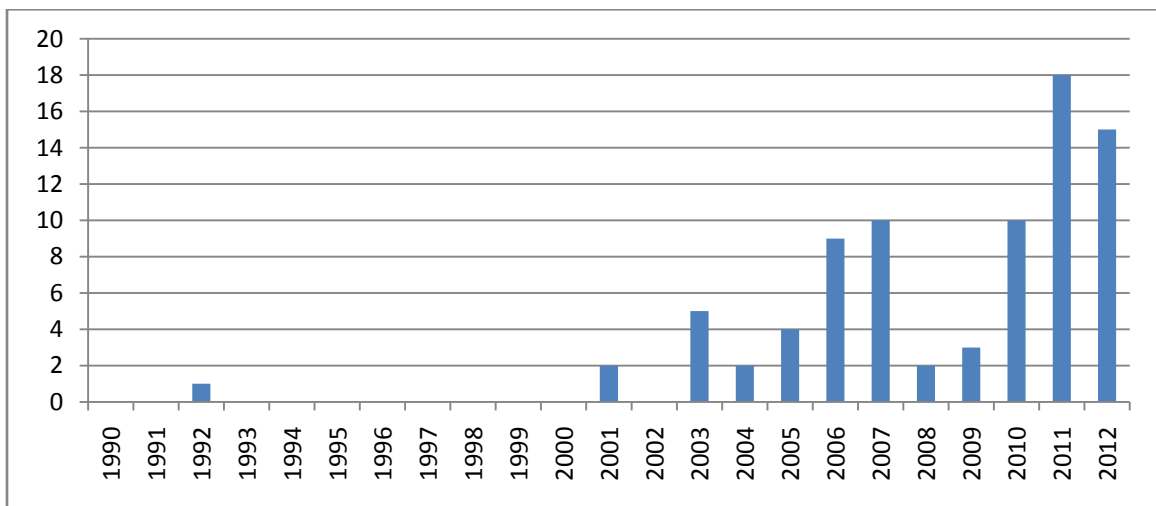


Figure 8 Number of Chinese Journal Publications on Crisis Management since 1990

It is also interesting to note that within the Chinese nuclear community, Second Artillery officers and personnel were the latest to attend U.S.-Chinese nuclear dialogues. As a traditionally more isolated and sensitive organization, it took a longer time to agree to join the conversations. Some of the Second Artillery officers, such as Wu Tianfu, Sun Haiyang, and Major General Wang Xiaodon from the Second Artillery Command

⁴⁷⁷Li, "China's Nuclear Strategy (中国核战略辨析)."; Yi (刘怡) Liu, "After Mad: Deliberating China's Nuclear Strategy and Missile Defense (中国“反导”背后的核战略思量——在 mad 之后)," *World Atlas (世界博览)*, no. 3 (2010); Li and Xiao, "Rethinking the Role of Nuclear Weapons (重审核武器的作用)."; Rui (侯锐) Hou, "Research on U.S. Strategic Nuclear Missiles and the Cold War: 1945-1968 (美国战略核导弹历史与冷战进程研究: 1945-1968)" (Northeast Normal University (东北师范大学)).

⁴⁷⁸Wang and (徐辉), "An Comparative Analysis of Sino-U.S. Crisis Behavior (中美危机行为比较分析)."

College, only began to participate in these dialogues starting from the early 2000s.⁴⁷⁹ In the case of U.S.-China Strategic Dialogue, Major General Yao Yunzhu from the Academy of Military Sciences could not make it to the first three meetings but was able to attend meetings since 2010.⁴⁸⁰

Because of the relative lack of engagement between the PLA personnel and their U.S. counterparts, there appears to be more misunderstanding between the two sides.

American analysis of the Second Artillery's nuclear operation still relies heavily on publications of Chinese officers, which have generated a number of major misunderstandings. On the issue of crisis management, for example, the book published by the Second Artillery in 2004 titled *Science of Second Artillery Campaigns* discusses situations in which China might need to "lower the nuclear deterrence threshold." This was interpreted by American experts as evidence that China prepares to use nuclear threats to deter conventional wars or in scenarios of conventional conflicts.⁴⁸¹ But what the book really talks about by referring to "lowering the nuclear deterrence threshold" is actually raising the alert status during a crisis rather than using nuclear weapons in scenarios other than a retaliatory strike.⁴⁸² Similar misunderstandings took place over the terms used by the Second Artillery such as "conventional war under nuclear deterrence" or "double deterrence."⁴⁸³ Such episodes also suggest that long-term operational-level engagement is essential for building shared vocabulary and reaching common understandings.

⁴⁷⁹ Data collected from various operation-level dialogues participants lists.

⁴⁸⁰ Data collected from the official participants lists of the U.S.-China Strategic Dialogue.

⁴⁸¹ Thomas J Christensen, "The Meaning of the Nuclear Evolution: China's Strategic Modernization and Us-China Security Relations," *Journal of Strategic Studies* 35, no. 4 (2012).

⁴⁸² Wu, "Issues in Sino-U.S Nuclear Relations: Survivability, Coercion and Escalation."

⁴⁸³ Christensen, "The Meaning of the Nuclear Evolution: China's Strategic Modernization and Us-China Security Relations."; Wu, "Issues in Sino-U.S Nuclear Relations: Survivability, Coercion and Escalation."

Strategic Trust

Accepting American Arms Control Theories

The Chinese nuclear community learned game theory and was the first to introduce American/Western nuclear deterrence and arms control theories into China.⁴⁸⁴ These theories were quickly internalized within the Chinese nuclear community and were widely spread to influence a much larger Chinese audience. These U.S.-originated theories gradually become the theoretical foundations of Chinese thinking on nuclear strategy and arms control policies, which makes it much easier for the two countries to reach a common understanding and find shared interests on important nuclear issues.

Deeper Understanding of U.S. Interests and Decision Making

Operational-level engagement has provided useful opportunities for the Chinese nuclear community to get a better understanding of different perspectives of U.S. domestic debates and the complicated motivation structure behind U.S. policy deliberation. The U.S. participants in many of the nuclear dialogues and exchanges came from various government institutions and nongovernmental organizations such as the Department of State, the Department of Defense, the Department of Energy, national labs, military colleges, think tanks, defense contractors, and academia. They presented different views within the U.S. policy and research circle and introduced the Chinese to their domestic policy debates and interagency coordination mechanisms. As a result, the Chinese were able to develop a much more sophisticated understanding of the U.S. definition of interests and policy incentives. As one Chinese analyst put it, "The U.S. national missile

⁴⁸⁴Sun, "Theories and Practice in Arms Control (军备控制的理论与实践)."

defense plan is not purely a weapon development plan: it is subject to all kinds of influences and constraint. Besides the influence of objective security environment, technology development, and reaction of the international society, the U.S. domestic politics also has a significant, sometimes decisive impact on its national missile defense plan.”⁴⁸⁵

The publications of the Chinese nuclear community also indicate a greater level of understanding about the historical, cultural, and political background and nuances of the U.S. domestic nuclear policy discussion.⁴⁸⁶ The Chinese mastery of U.S. terminology and analytical framework has also enabled them to participate directly in technical and policy discussions around U.S. ballistic missile defense with their American colleagues and to seek to influence U.S. debates on missile defense.⁴⁸⁷ During the late 1990s and early 2000s, Chinese analysts conducted a large number of in-depth studies on U.S. domestic debates around missile defense, analyzing domestic political struggles and technical aspects of the proposed U.S. missile defense systems.⁴⁸⁸ They particularly applied the U.S. framework on offense-defense balance and strategic stability to highlight the negative impact of missile defense development on global security and stability in East

⁴⁸⁵Tao (何涛) He, "Conservatism and U.S. National Missile Defense Plan after the Cold War (保守主义与冷战后美国的国家导弹防御计划)" (The PLA University of Foreign Languages (中国人民解放军外国语学院), 2007).

⁴⁸⁶Hongxia (戴洪遐) Dai, "National Missile Defense Systems (Nmd): A Cultural Analysis (国家导弹防御系统 (Nmd): 一种文化的分析)," *Xinjiang Social Forum (新疆社科论坛)*, no. 4 (2001); Lineng (陈立能) Chen, "U.S. Domestic Debates around Missile Defense Strategy (美国国内围绕导弹防御战略的争论)," *International Perspective (国际展望)* 15(1996); Yongtao (刘永涛) Liu, "U.S. President, Congress, and the "Missile Defense Plan" (美国总统, 国会与 “导弹防御计划”)," *ibid.*3(2001).

⁴⁸⁷Medeiros, *Reluctant Restraint: The Evolution of China's Nonproliferation Policies and Practices, 1980-2004*.

⁴⁸⁸Liu, "U.S. President, Congress, and the "Missile Defense Plan" (美国总统, 国会与 “导弹防御计划”)."

Asia and argued that missile defense “is going to put an end to traditional nuclear strategies.”⁴⁸⁹

Finding Common Interests

During U.S.-Chinese dialogues, Chinese participants were convinced that China’s decision to build a small nuclear arsenal was correct. After getting a better understanding of all the costs and problems that the United States had encountered with dismantling and destroying retired and excessive nuclear weapons, the Chinese began to further deemphasize the need to significantly build up their nuclear forces, realizing that they would have to go through the same painful process of destroying large numbers of retired nuclear weapons if they built too large an arsenal. This has helped the United States and China achieve a certain level of common understanding regarding future nuclear weapons development. It also helped the Chinese to recognize that it was in both countries’ interests not to test and obtain more advanced nuclear weapons, which contributed to their cooperation on CTBT negotiations.⁴⁹⁰ As discussed in details in the previous sections, operational-level engagement greatly facilitated the growth and expansion of China’s nuclear community and has helped China’s nuclear community to build up technical capacity to address nuclear policy issues. During this process, the perception of the Chinese nuclear community changed significantly. They took the lead in analyzing and drafting China’s nuclear strategy and have introduced and internalized important American nuclear terms into the Chinese policy and decision-making circle. This

⁴⁸⁹Zhonghua (陶中华) Tao, "Impact of Missile Defense System on International Strategic Landscape (导弹防御系统对国际战略格局的影响)," *Defence Science and Technology* (国防科技), no. 9 (2004); Zifeng (董子峰) Dong, "U.S. Missile Defense System and the End of Traditional Nuclear Strategy (美国导弹防御系统与传统核战略的终结)," *Pacific Journal* (太平洋学报), no. 4 (2004).

⁴⁹⁰Zou, "China and the Ctbt Negotiations."

emergence of a common vocabulary and the convergence of perception between the United States and China have greatly helped the two sides to identify important common interests that were overlooked before.

Moralistic Trust

Chinese Perception of U.S. Principles and Rules of Behavior

Over the course of decades of operational-level engagement, the Chinese nuclear community's perception about the principles and rules of behavior to which the United States subscribes when it comes to the issue of nuclear arms control has not substantially changed. There also is little evidence suggesting a major gap between the perceptions of the Chinese nuclear community and those of China's top leadership. In general, there are three major U.S. principles and rules of behavior from the Chinese perspective.

Principle 1: Pursuit of "Absolute Security"

The Chinese nuclear community's reading of the U.S. strategic objective during the Cold War emphasized that the United States was not fully committed to a mutually assured destruction relationship with the Soviet Union. The U.S. efforts in developing "damage limitation" strategies convinced the Chinese that the United States was not at all comfortable with MAD. The United States only reluctantly accepted MAD with the Soviet Union after the Soviets obtained a strong enough nuclear capability.⁴⁹¹ As for China, the perception is that the United States did not accept a MAD relationship with

⁴⁹¹Jia (许嘉) Xu and Heng (张衡) Zhang, "The Trend of American Nuclear Policies' Adjustments and Its Influences after the Cold War (冷战后美国核政策的调整趋势及影响)," *World Economics and Politics (世界经济与政治)*, no. 03 (2011); Wu, "Nuclear Deterrence (核威慑)."; Jian (赵骞) Zhao, "The Shift of U.S. Nuclear Strategy and Its Reason (美国核战略变化及原因探析)," *People's Forum (人民论坛)*, no. 14 (2012).

China from the very beginning. The U.S. development and deployment of a limited missile defense system in the 1960s and 1970s was seen as primarily aimed at obtaining a capability to defend against possible Chinese missile strikes.⁴⁹² The Reagan administration's SDI was not seen as mainly targeted against China, but the Chinese nuclear community's interpretation of the U.S. motivation behind SDI was an effort of the United States to regain strategic superiority over the Soviet Union.⁴⁹³

This same perception continued as the United States refocused on the development of ballistic missile defense systems starting from the 1990s. Members of the Chinese nuclear community were very vocal in expressing their opposition toward the U.S. missile defense plan and the widely accepted view was that this was a renewed U.S. effort to obtain "absolute superiority" and "absolute security" in a unipolar world.⁴⁹⁴

Although the Chinese have generally abandoned the more colorful Cold War term of "nuclear hegemony," the perception of U.S. pursuit of "absolute security" beyond

⁴⁹²Yang (张杨) Zhang, "U.S. Early Missile Defense Deployment Plan and China's Development of Strategic Nuclear Weapons (美国早期 abm 部署计划与中国战略核导弹发展)," in *American National Security and Cold War Strategy (美国国家安全与冷战战略)*, ed. Qun (于群) Yu(Beijing: China Social Sciences Press (中国社会科学出版社), 2006); Shuifu (汤水富) Tang, "Why the United States Is Particularly Interested in Nmd (美国为何对 nmd 情有独钟)," *Outlook Newsweek (瞭望新闻周刊)*, no. 2 (2001).

⁴⁹³Zhuang, "An Analysis of the U.S. "Star Wars" Initiative (美国 "星球大战" 计划剖析)."; Yang (张杨) Zhang, "China's Development of Strategic Nuclear Weapons and U.S. Initial Missile Defense Deployment Plan (中国战略核武器发展与美国早期 abm 部署计划)," *Contemporary Chinese History (当代中国史研究)*, no. 1 (2004); Glaser and Garrett, "Chinese Perspectives on the Strategic Defense Initiative."

⁴⁹⁴Sun, "New Challenges and New Agenda for China's Arms Control (中国军控的新挑战与新议程)."; Lu, "U.S.-China Arms Control Interaction and Its Theoretical Analysis (中美在军控领域的交流及其理论分析)."; Sun, "Theories and Practice in Arms Control (军备控制的理论与实践)."; Jie (赵杰) Zhao, "Analysis of U.S. Missile Defense Plan and China's National Security (美国导弹防御计划与中国国家安全分析)" (Tsingdao University (青岛大学), 2009); Hongyi (聂宏毅) Nie, "The Second Cold War Is Coming? A Strategic Analysis of the U.S. Deployment of Missile Defense System in East Europe (第二次 "冷战" 正在降临?——对美国在东欧部署导弹防御系统的战略分析)," *International Perspective (国际展望)*, no. 13; Qiong (王琼) Wang and Xuying (万绪英) Wan, "A New Evidence of Hegemony in the New Century: Analyzing the Impact of the Deployment of Missile Defense System by the United States (新世纪霸权的又一例证——评美国部署弹道导弹防御系统的影响)," *Modern Weaponry (现代兵器)*, no. 1 (2005).

mutually assured destruction or mutual vulnerability remains the same.⁴⁹⁵ This view was shared widely within the Chinese community and among experts from different sectors. Even the often-regarded “liberal” Chinese experts held this view, too.⁴⁹⁶

Even after the Obama administration came into power in 2009—and President Obama’s personal endorsement of a “world free of nuclear weapons”—the general reaction from the Chinese nuclear community has so far still been skeptical. They often understand the motivation behind this new policy rhetoric as at least partially aimed at helping sell the U.S. nonproliferation and antinuclear terrorism agenda and maintaining American overall military superiority in a world without nuclear weapons.⁴⁹⁷ Most Chinese analysts believe that President Obama’s policy change was primarily a result of his different interpretation of the international security environment from President Bush rather than a genuine change of understanding about nuclear weapons and coercive diplomacy. Obama openly declared that nuclear terrorism is “the single biggest threat” to U.S. security⁴⁹⁸ and therefore saw nuclear weapons as less useful for addressing American security concerns. From their interpretation, Obama’s call for a “world free of nuclear weapons” was “based

⁴⁹⁵Xinhua News Agency, “Kennedy Pledged to Strengthen the Dual Policy, Boasting That Last Year's Nuclear Blackmail During the Caribbean Crisis Was Successful; Wanting to Build up Arms and Win Peace at the Same Time (肯尼迪叫嚷加強推行兩手策略吹噓去年加勒比危機時期的核訛詐政策成功；揚言今後既要加緊擴軍又要“爭取和平”，既願意談判又不惜一戰),” *People's Daily*, October 22 1963; Chu (赵楚) ZHao, “Nuclear Blackmail: Three Simple Facts Behind Hegemonic Rhetoric (核讹诈:霸权话语背后的三个简单事实),” *International Perspective (国际展望)*, no. 7 (2002).

⁴⁹⁶Yinhong (时殷弘) Shi, “U.S. National Missile Defense Plan and China's Response (美国国家导弹防御计划与中国的对策),” *The Pacific Journal (太平洋学报)*, no. 04 (2000).

⁴⁹⁷Zunzun (朱尊尊) Zhu and Qin (安钦) An, “Russo- U. S. Relations from the Perspective of a Guided Missile Defense System (导弹防御系统问题视角下的俄美关系),” *Siberian Studies (西伯利亚研究)* 36, no. 3 (2009); Qingjun (王清军) Wang and Yizhi (郭懿芝) Guo, “China's Missile Defense Challenges U.S. “Nuclear Hegemony” (中国反导冲击美国 “核霸权”),” *World Journal (世界报)*, March 6, 2013 2013; Zhijun (王志军) Wang, “On the United States' Political Theology of “Absolute Security” and Obama's “Nuclear-Free World” (论美国 “绝对安全” 神学政治与奥巴马 “无核世界思想”),” *International Forum (国际论坛)* 12, no. 1 (2010).

⁴⁹⁸David Jackson, “Obama: Nuclear Terrorism Is ‘the Single Biggest Threat’ to Us,” *USA Today* 11(2010).

on considerations to pursue its own security interests,”⁴⁹⁹ and he never “intended to give up the goal of maintaining (the U.S.) nuclear superiority of the number one in the world.”⁵⁰⁰

Principle 2: Technology Supremacy

There is a consensus among the Chinese nuclear community about the U.S. obsession with technology supremacy. They believe the United States attaches particular significance to obtaining and relying on superior military technology for its national security. The perception that the United States prefers relying on technological supremacy to relying on a cooperative security framework for defending its national security interests is viewed by the Chinese nuclear community as a deeply buried preference for self-help over cooperative security or “common security.”⁵⁰¹

Superior military technology has helped the United States better defend its national security interests in international nuclear arms control talks over CTBT and the fissile material cutoff treaty.⁵⁰² More importantly, the United States is perceived as always attempting to rely on technological breakthroughs, which can save it from the MAD relationship with other nuclear weapons states and which can provide it with more

⁴⁹⁹Zikui (刘子奎) Liu, "Analysis of Obama's Nuclear Free World Strategy (奥巴马无核武器世界战略评析)," *American Studies (美国研究)* 3(2009).

⁵⁰⁰Jian (赵剑) Zhao, "The Changed and Unchanged of the U.S. Nuclear Strategy: Assessment of Obama Administration's Nuclear Posture Review Report (美国核战略的“变”与“不变”——对奥巴马政府《核态势评估报告》的分析)," *Peace and Development (和平与发展)*, no. 4 (2010).

⁵⁰¹Zhenfei (姜振飞) Jiang and Feitao (刘飞涛) Liu, "Geopolitics and American Missile Defense Plan in East Europe (地缘政治与美国东欧反导计划)," *International Studies (国际问题研究)*, no. 6 (2007).

⁵⁰²Xie, "In Order to Maintain Nuclear Deterrence Capability under Comprehensive Test Ban Treaty, the United States Is Planning to Build a Series of Nuclear Explosion Simulation Facilities (为在全面禁止核试验条件下保持核威慑力量——美国拟新建若干核爆炸仿真试验设施)."; Wang, "The Situation before the Comprehensive Test Ban Treaty Opens for Signature (全面禁止核试验条约签署前的形势)."; "The United States Promotes Comprehensive Nuclear Test Ban (美国推动全面禁止核试验)," *ibid.* 8(1993).

freedom to act with little constraint. According to the Chinese reading of the American history of missile defense development, the United States was more willing than other countries to pursue new military technologies even though there is uncertainty regarding the ultimate success of such technology and this unilateral pursuit of new technology will risk jeopardizing existing cooperative security frameworks and arms control agreements. The insistence on developing ballistic missile defense capability, particularly the national missile defense, was a classic example of this American penchant from the Chinese perspective.⁵⁰³

The development of advanced conventional prompt global strike (CPGS) systems by the United States reinforces the Chinese perception. The CPGS capability opens the possibility for the United States to launch preemptive strikes over Russian and/or Chinese nuclear forces in a disarming or “damage limitation” operation. This could pose a serious threat to Russian and Chinese second-strike capability and add unprecedented new variable in the traditional nuclear balance based on MAD.⁵⁰⁴ The United States declared its motivation in developing this capability was to defeat time-sensitive targets such as high-value terrorists.⁵⁰⁵ However, the benefit of obtaining this capability is viewed as relatively small (striking a limited number of terrorists) by most Chinese experts, but the cost could be enormous because it threatens the existing nuclear stability between the

⁵⁰³Dengxue (黄登学) Huang, "Can Russia and the United States Solve Their "East European Missile Defense" Dispute? (俄美能否化解“东欧导弹防御系统”争端?), " *Issues of Contemporary World Socialism* (当代世界社会主义问题), no. 3 (2008); Jiang and Liu, "Geopolitics and American Missile Defense Plan in East Europe (地缘政治与美国东欧反导计划)."; Haoqing (冯昊青) Feng, "Research of Unclear Ethics Based on Nuclear Security and Development (基于核安全发展的核伦理研究)" (Central South University (中南大学)).

⁵⁰⁴Yong (方勇) Fang, "The United States Presses Forward the Prompt Global Strike Plan (美国推进快速全球打击计划)," *New Era National Defense* (新时代国防), no. 2 (2010).

⁵⁰⁵Amy F Woolf, "Conventional Prompt Global Strike and Long-Range Ballistic Missiles: Background and Issues," in *CRS Report for Congress*(Washington DC: Congressional Research Service, May 5, 2014).

major nuclear powers.⁵⁰⁶ Therefore, the U.S. insistence on developing the CPGS technology is viewed as another example of its embrace of technology supremacy.⁵⁰⁷

Principle 3: Peace through Strength

The third commonly shared Chinese perception is that the United States believes in “peace through strength” in the nuclear field. One example highlighted by the Chinese nuclear community is the dissuasion strategy often discussed in the United States and officially embraced since the George W. Bush administration. The 2002 Nuclear Posture Review explicitly sought to maintain a nuclear capability that could dissuade nations from military competition with the United States and defeat those who attack.⁵⁰⁸ This same policy also appeared in other official documents such as the Department of Defense’s 2008 document *National Security and Nuclear Weapons in the 21st Century*.⁵⁰⁹ There have also been a lot of U.S. domestic discussions about the dissuasion strategy.⁵¹⁰ Such open advocate for a “dissuasion strategy” was seen as a reflection of U.S. propensity to use superior power and coercive means to contain the rise of other

⁵⁰⁶ Aicheng (逢爱成) Pang and Fengzhi (黄凤志) Huang, "Financial Crisis and Adjustment of U.S. Hegemonic Strategy (金融危机与美国霸权战略的调整)," *Northeast Asia Forum (东北亚论坛)* 1(2012).

⁵⁰⁷ Zikui (刘子奎) Liu, "An Analysis of the Nonproliferation Policy Shift under the Obama Administration (试析奥巴马政府防扩散政策的调整)," *Contemporary International Relations (现代国际关系)*, no. 4 (2011); Zhenfei (姜振飞) Jiang and Jinyu (程金玉) Cheng, "Analyzing the Obama Administration's Nuclear Deterrence Policy (析奥巴马政府的核威慑政策)," *Linyi University Journal 9 临沂大学学报*, no. 2 (2012).

⁵⁰⁸ David Ruppe, "Experts Question a Core U.S. Arms Control Tenet," (Washington DC: Global Security Newswire, November 2004).

⁵⁰⁹ "National Security and Nuclear Weapons in the 21st Century," (Washington DC: Department of Defense and Department of Energy, September 2008).

⁵¹⁰ *U.S. Nuclear Deterrence in the 21st Century: Getting It Right*, (New Deterrent Working Group, 2009); Glen M. Segell, "Thoughts on Dissuasion," *Journal of Military and Strategic Studies* 10, no. 4 (Summer 2008); Jonathan D. Hagood, "Dissuasive Nuclear Strategies: The Strategic Concept of Dissuasion and the U.S. Nuclear Arsenal," in *The Center for Strategic and International Studies Project on Nuclear Issues (PONI) Conference* (October 14, 2004); "Dissuasion in U.S. Defense Strategy," (Center for Contemporary Conflict, 22 September 2004).

countries and therefore maintain peace.⁵¹¹ As one Chinese expert puts it, “The United States has two basic principles. One is not to allow an enemy to project military power onto the U.S. territory, i.e. not to allow Americans be under any direct military threat. The second is not to allow the emergence or existence of any country or group of countries that can compete with the United States at the global level.”⁵¹²

U.S. withdrawal from the Anti-Ballistic Missile Treaty despite strong international concern and criticism and the U.S. Senate’s rejection of the CTBT despite overwhelming international support for the treaty also were seen by the Chinese as examples of the United States using its unchallenged power to reverse or jeopardize international arms control progress for its own security interests. The U.S. willingness to use coercive power to achieve preferred objectives in its handling of Iraqi, Iranian, Libyan, and North Korean nuclear crises reinforces the Chinese perception.⁵¹³

As debate raged in the United States over a national missile defense system in the late 1990s, the Chinese nuclear community made a great effort to express its opposition and to try to dissuade the United States from making a decision to develop a national missile defense system. These efforts were repeatedly made at various operational-level

⁵¹¹Liping (夏立平) Xia and Chongwen (孙崇文) Sun, "Nato's Nuclear Strategy in the Post-Cold War Era (论冷战后时期的北约核战略)," *European Studies 9 欧洲研究*, no. 6 (2012); Jianshu (崔建树) Cui, "The Evolution of American Nuclear Strategy and Nonproliferation Policy from the Bush to Obama Administration (从小布什到奥巴马政府的美国核战略和核不扩散政策演变)," *Peace and Development (和平与发展)* 5(2009).

⁵¹²Wang and Wan, "A New Evidence of Hegemony in the New Century: Analyzing the Impact of the Deployment of Missile Defense System by the United States (新世纪霸权的又一例证——评美国部署弹道导弹防御系统的影响)."

⁵¹³Fan, "Summary of the Workshop on Arms Control and U.S.-China Relations (军控与中美关系研讨会综述)."; Xinning (郭新宁) Guo, "On China's Relationship with Developing Countries in International Arms Control and Disarmament (中国与发展中国家在国际军控与裁军进程中的关系)," *Foreign Affairs Review (外交评论)*, no. 4 (2007).

dialogues and exchanges and through a large number of open publications.⁵¹⁴ In the end, the United States went ahead with its plans, making the Chinese believe that their voice was not heard or paid attention to because they were weak in power and capability. As one Chinese analyst summarizes, “As history has spoken, the logic of ‘peace through strength’ is more appreciated by the United States.”⁵¹⁵

Security Dilemma Sensibility

If the operational-level engagement has not been very successful in persuading the Chinese nuclear community from abandoning its *realpolitik* understanding of the U.S. principles, is there any evidence that at least such engagement has helped the Chinese nuclear community to develop a deeper appreciation of the possible existence of security dilemma between the United States and China on nuclear arms control issues?

Presumably, an increased security dilemma sensibility would help the two countries conduct more objective assessment of each other’s strategic intentions, be more capable of carrying out self-introspection, reduce self-righteousness, and be more aware of the likely consequences of one’s own actions in provoking fear from the other.⁵¹⁶

However, the empirics offer little evidence to prove that this has been the case. There was indeed a debate among the Chinese right around the time when the George W. Bush

⁵¹⁴Medeiros, "3rd Us-China Conference on Arms Control, Disarmament and Nonproliferation, Us-China Arms Control and Nonproliferation Cooperation: Progress and Prospects."; Yan He, "The Latest Development of the U.S. Missile Defense Program and Its Influence on the World Security" (paper presented at the 8th ISODARCO Beijing Seminar on: "Arms Control," Beijing, China, October 15, 2002); Jing - dong Yuan, "Chinese Responses to Us Missile Defenses: Implications for Arms Control and Regional Security," *The Nonproliferation Review* 10, no. 1 (2003).

⁵¹⁵Zhao, "Analysis of U.S. Missile Defense Plan and China's National Security (美国导弹防御计划与中国国家安全分析)."

⁵¹⁶Nicholas J Wheeler, "Nuclear Abolition: Trust-Building’s Greatest Challenge?," (International Commission on Nuclear Nonproliferation and Disarmament, 2009).

administration withdrew from the Anti-Ballistic Missile Treaty and pressed full speed ahead with the development of ballistic missile defense systems. Some Chinese analysts such as Shi Yinong (时殷弘) and Wu Zhengyu (吴征宇) raised attention to the issue of the security dilemma and argued that China should not seek to counter the U.S. development of ballistic missile defense through enhancing its nuclear capability because such Chinese reaction would be interpreted negatively by the United States and the two countries would fall into an action-reaction cycle that is common in a situation of a security dilemma.⁵¹⁷ This was the first time that the issue of security dilemma was raised in a domestic debate. Both sides of this debate drew on the Western literature and had an extensive exchange on what security dilemma means, what are the causes, and what are the implications for China's nuclear policy.

This debate in and of itself served to raise awareness of the concept of security dilemma within the Chinese nuclear community. With that said, its impact on the thinking of the overall community was very limited. The two sides of this debate disagreed on the ultimate driving forces behind security dilemma, and more importantly, they disagreed about whether China's self-restraint would help get the two countries out of a security dilemma situation.⁵¹⁸ At the end of the debate, there was still a strong sense that China had to stick to its self-help rule.⁵¹⁹ China's response in the following years seems to have

⁵¹⁷Shi, "U.S. National Missile Defense Plan and China's Response (美国国家导弹防御计划与中国的对策)."; Zhengyu (吴征宇) Wu, "'Calmly Respond' ≠ 'Self-Disarmament': U.S. National Missile Defense and China's Right Response (‘沉着应对’ ≠ ‘自废武功’——美国国家导弹防御计划与中国应有的对策)," *Contemporary International Relations (现代国际关系)*, no. 02 (2003).

⁵¹⁸Ruizhuang (张睿壮) Zhang, "'Calmly Respond' and 'Self-Disarmament': A Response to Mr. Shi Yinong on How to Deal with the U.S. National Missile Defense Plan (‘沉着应对’与‘自废武功’——就如何应对美国国家导弹防御计划同时殷弘先生商榷)," *World Economics and Politics (世界经济与政治)*, no. 01 (2002).

⁵¹⁹*Ibid.*

confirmed this generally dominant voice. China moderately increased the size of its nuclear forces and sought to obtain a capability to penetrate U.S. ballistic missile defense. In general, there was little evidence that the Chinese nuclear community has embraced a greater security dilemma sensibility as a result.

Lessons Drawn by the Chinese Nuclear Community

In according with their perception about U.S. principles and rules of behavior, the Chinese nuclear community has drawn a few lessons for defending its national security interests. These lessons suggest that the Chinese nuclear community is still very much preoccupied with *realpolitik* thinking, which long-term operational-level engagement does not seem to be capable of changing.

Lesson 1: Security through Strength

The Chinese nuclear community's engagement with the United States on the issue of missile defense and nuclear stability showed a good example of the Chinese drawing a lesson of "security through strength" from their experience in the bilateral interaction. After failing to influence the U.S. thinking and decision over missile defense development, the Chinese nuclear community reaffirmed that "development is the last word" and adopted a two-step strategy.⁵²⁰ The first step is to quickly develop a capability to defeat missile defense and restore stability/balance, and the second step is to join the missile defense development competition itself.⁵²¹

⁵²⁰Zhongming (许忠明) Xu, "Understanding the U.S. Missile Defense System (美国导弹防御系统之我见)," *Journal of Yanbian University (Social Science)* (延边大学学报: 社会科学版) 34, no. 3 (2005).

⁵²¹Wang and Guo, "China's Missile Defense Challenges U.S. "Nuclear Hegemony" (中国反导冲击美国 "核霸权")."

As the Chinese nuclear community was in communication with U.S. colleagues in the 1990s when U.S. interests in ballistic missile defense mounted, Chinese experts were following the U.S. development but were not conducting much technical research on countering ballistic missile defense. This changed dramatically at the beginning of the 2000s, when the Chinese nuclear community began to realize that its voice was not going to have any impact on the growing U.S. commitment to ballistic missile defense. They began to invest heavily in technical research on how to counter or penetrate ballistic missile defense, as reflected in Figure 9.

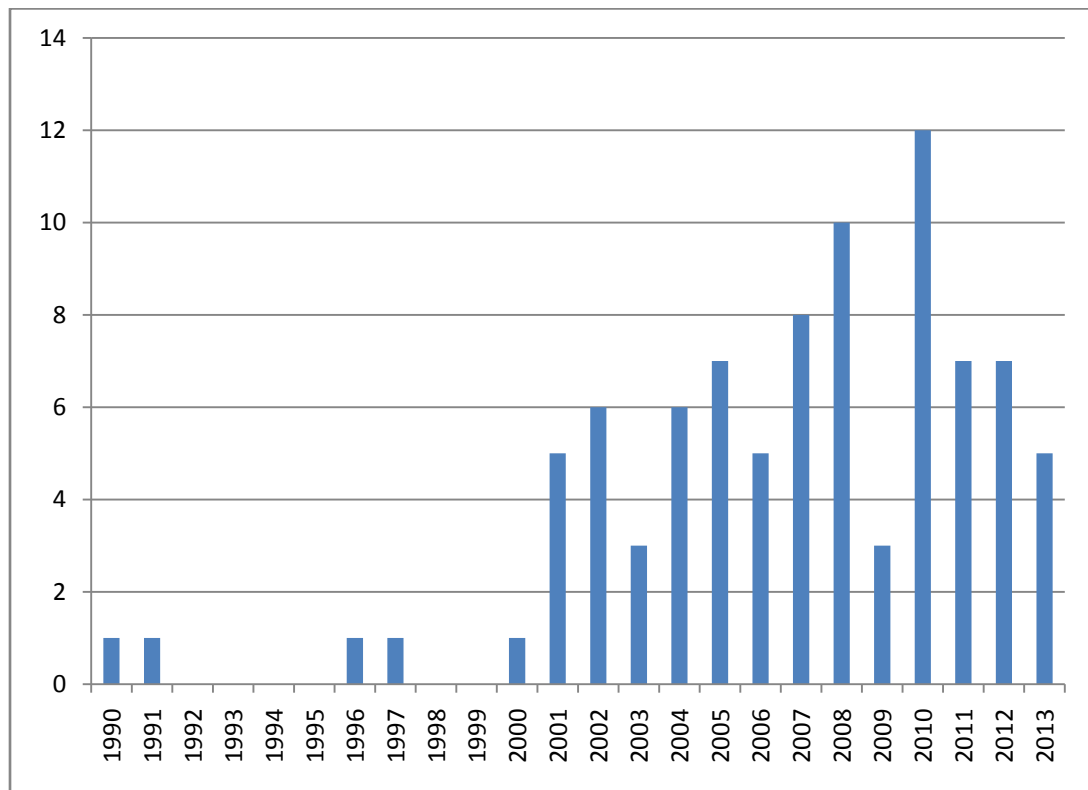


Figure 9 Number of Technical Research Articles on Ballistic Missile Defense Penetration

Having conducted several years of research on approaches to counter ballistic missile defense and obtaining an initial capability, the Chinese nuclear community began to

focus on the so-called proactive countermeasures—for example, to carry out research and development of its own ballistic missile defense capability.⁵²² This was completely in line with China's first anti-satellite test in 2007 and midcourse interception tests in 2010 and 2013.⁵²³ In fact, the anti-satellite test in 2007 demonstrated China's capability to counter U.S. ballistic missile defense by destroying its early-warning satellites.⁵²⁴ More importantly, the anti-satellite test was also aimed at laying the technical foundation for developing China's own ballistic missile defense capability.⁵²⁵ The 2007 test served as the transition point in China's two-step response to the U.S. development of ballistic missile defense system.

This same two-step response strategy also applies to China's overall nuclear development. After China felt a threat from the U.S. nuclear weapons, the first response was to obtain very limited nuclear capability as a countermeasure for the purpose of restoring stability/balance.⁵²⁶ China regarded the purpose of its nuclear weapons as to counter what

⁵²²See, for example, Enyu (高恩宇) Gao and Xiaokun (刘晓坤) Liu, "A Simplified Model for the Interception Rate of Ballistic Missile Defense Systems (弹道导弹防御系统拦截概率的简化模型)," *Missiles and Space Vehicles (导弹与航天运载技术)*, no. 3 (2013); Zhihe (肖志河) Xiao et al., "Radar Identification Technology for Ballistic Missile Defense (弹道导弹防御的雷达目标识别技术)," *Aerospace Electronic Warfare (航天电子对抗)*, no. 6 (2011); Qixing (吴启星) Wu and Weihua (张为华) Zhang, "Calculation of the Interception Window of Mid-Course Ballistic Missile Defense (弹道导弹中段防御的拦截窗口分析)," *Flight Mechanics (飞行力学)* 23, no. 2 (2005).

⁵²³Tong (钱彤) Qian, "China Conducted a Successful Land-Based Mid-Course Anti-Missile Interception Test within Its Border (中国在境内进行陆基中段反导拦截技术试验)," Xinhua News Agency, http://news.xinhuanet.com/2013-01/27/c_124285256.htm; Heping (袁和平) Yuan, "China Building Land-Based Anti-Missile Defensive Shield (中国构建陆基反导防御盾牌)," *Science and Technology Defense Industry (国防科技工业)*, no. 2 (2013).

⁵²⁴Gang (洛刚) Hao, "A Research on U.S. Missile Defense Plan and China's Capability Development Countermeasures (美导弹防御计划与我装备发展对策研究)," *Journal of the Academy of Equipment Command & Technology (装备指挥技术学院学报)* 16, no. 2 (2005).

⁵²⁵Xionghui (童雄辉) Tong et al., "The Development Trend of American and Russian Space Offense-Defense Weaponry (美俄空间攻防武器装备的发展趋势)," *Missiles and Space Vehicles (导弹与航天运载技术)* 6(2004).

⁵²⁶Xuegong (赵学功) Zhao, "The Nuclear Blackmail Policy of the Eisenhower Administration During the Korean War (论艾森豪威尔政府在朝鲜战争中的核讹诈政策)," *Nankai Journal (南开学报)* 4(1997).

they called “nuclear blackmail.” In their view, nuclear weapons are primarily a political weapon that would keep China from being intimidated by the super powers.⁵²⁷ For decades after China’s first nuclear explosion, China kept the size of its nuclear stockpile very limited and seemed to attach great importance to possessing nuclear weapon systems rather than building up its stockpile.⁵²⁸ After the successful full-range test of the DF-5 intercontinental ballistic missile (ICBM) and the introduction of the JL-1 submarine-launched ballistic missile (SLBM), Deng declared in a 1986 meeting of the Political Bureau of the CPC Central Committee, “Since today, China has the capability to defend its motherland. We are able to launch a nuclear counterattack if we are struck by nuclear weapons from a foreign country.”⁵²⁹ Since then, China’s focus has been to catch up with the technology development in the United States and other nuclear powers and not be left behind in a technological competition. In recent decades, China has had one of the world’s most active nuclear modernization programs but still keeps the overall size of its nuclear stockpile at a very moderate level.⁵³⁰

Lesson 2: Capability as Leverage

As a response to the perceived U.S. principles of technological supremacy and peace through strength, the Chinese nuclear community is convinced that to be treated seriously and equally in negotiations with the United States, China needs to possess sufficient capability as a source of leverage. The Chinese attributed their inability to influence U.S.

⁵²⁷ Junting (李俊亭) Li, "The Strategic Choice That Made China Straighten Its Back (使中国挺直腰板的战略性抉择)," *Contemporary China History Studies (当代中国史研究)* 2(2005).

⁵²⁸ Jeffrey Lewis, "China's Nuclear Idiosyncrasies and Their Challenges," in *Proliferation Papers*, No. 47(2013).

⁵²⁹ Xiaoping (邓小平) Deng, "Selected Writings of Deng Xiaoping, Volume Iii (邓小平文选 (第三卷)), "(Beijing, China, Central Literature Publishing House (中央文献出版社): Editorial Committee on Party Literature of the Central Committee (中共中央文献编委会), 1994).

⁵³⁰ Kristensen and Norris, "Chinese Nuclear Forces, 2013."

decision making on ballistic missile defense to their weak missile capability and their lack of technological prowess over missile defense.⁵³¹ The ultimate lesson that they drew from this experience was that “reliable penetration tactics and countermeasure capability [are] the foundation of China’s diplomatic negotiations.”⁵³²

This perception is shared widely across the Chinese nuclear community. Liu Huaqiu, a top Chinese arms control expert and a long-term participant of U.S.-Chinese nuclear dialogues, summarizes it as such: “I think it is true that China has been passive on arms control issues. This is because China’s nuclear capability is relatively underdeveloped (compared to other nuclear weapons states). The post–World War II history has made it clear that the countries that can seize the initiative of international arms control are always those that get ahead in the development of military capability.”⁵³³ According to a similar logic, many Chinese experts argue that to catch up technologically with other countries and to develop advanced military technology are objectives in themselves because, according to them, “advanced technology is also an important strategic deterrence resource.”⁵³⁴

Norms and China’s Nuclear Arms Control Policy

Moral principles used to be a very important consideration behind China’s nuclear policy. China believed in the power of moral constraints over countries’ nuclear policies in general—not simply over its own nuclear policy. Chinese experts pointed out that

⁵³¹Wang and Guo, "China's Missile Defense Challenges U.S. "Nuclear Hegemony" (中国反导冲击美国 “核霸权”)."

⁵³²Zhao, "Analysis of U.S. Missile Defense Plan and China's National Security (美国导弹防御计划与中国国家安全分析)."

⁵³³Liu, "Analysis of China's Nuclear Arms Control Policy (中国核军控政策评析)."

⁵³⁴Tianfu (武天富) Wu, "Understanding China's Missile Defense Interception Test Technology (中国反导拦截技术试验解读)," *Outlook (瞭望)*, no. 03 (2010).

Chinese leaders very much appreciated the power of nuclear taboo in influencing a country's nuclear policy-making. Mao Zedong, for instance, spoke forthrightly about the limited role of nuclear weapons: "Some fools are still talking about (using) nuclear weapon, but it will never be used again. The nuclear explosion in Japan at the same time destroyed (the nuclear weapon) itself, because people all over the world are against its use."⁵³⁵ Mao believed that even the "imperialists" in the United States would not be able to bear the huge moral burdens of using nuclear weapons again because of the extraordinary destructive power of nuclear weapons that had been shown in Hiroshima and Nagasaki. After a very long time since China's first nuclear explosion, China seemed relatively comfortable with possessing a very weak and vulnerable nuclear force. This is also at least partly due to the Chinese faith in the influence of the so-called nuclear taboo that they believed would effectively deter the United States from launching a nuclear first strike against China.⁵³⁶

The Chinese subscription to the moral constraints of nuclear weapons also greatly influenced Beijing's nuclear policy-making. China's unconditional No First Use policy was made at the very beginning of its possession of nuclear capability largely out of political and moral concerns rather than strategic calculations.⁵³⁷ China's pledge that it would never use nuclear weapons against any nonnuclear weapons states was made at the

⁵³⁵Yin and Huang, *A Century's Review: A Global History of Atomic Weapons* (世纪回眸: 世界原子弹风云录).

⁵³⁶Li and Xiao, "Rethinking the Role of Nuclear Weapons (重审核武器的作用)."; Riqiang (吴日强) Wu, "Just War, Nuclear Taboo and Nuclear-Weapon-Free World (正义战争、核禁忌与无核武器世界)," *World Economics and Politics* (世界经济与政治), no. 10 (2009).

⁵³⁷Li and Nie, "A Study of Sino-U.S. Strategic Stability (中美战略稳定性的考察)."

same time and for similar reasons.⁵³⁸ These pledges were later proven not to be empty diplomatic rhetoric. It has actually trained its nuclear forces to act in full accordance with its assigned task—to conduct nuclear retaliatory strikes in environments and situations when it has been attacked with nuclear weapons first.⁵³⁹ There does not seem to have been serious debate in China over whether it should consider using nuclear weapons first. The Chinese nuclear community seems to have a firm understanding about nuclear taboo and to have raised moral concerns for their reason to reject a first-use policy.⁵⁴⁰

Other examples of China's response to moral or normative requirements include China's sensitivity to the normative demands of developing countries in supporting nuclear weapon-free zones. For a very long time, China disliked its de facto membership in one of the nuclear "haves." It employed policies (such as No First Use and negative security assurance) to separate itself from other nuclear weapons states and identified itself with most nonaligned-movement countries and developing countries.⁵⁴¹ After the Chinese-Soviet split in 1960, China essentially isolated itself from involvement in any international discussion on nuclear issues for almost two decades. But as many Latin American countries began to ask for the establishment of a nuclear weapon-free zone in Latin America, China felt the need to respond. China was the first among the P-5 to sign Protocol Number 2 to the Treaty of Tlatelolco for the Prohibition of Nuclear Weapons in

⁵³⁸Xiangli (孙向丽) Sun, "Features and Characteristics of China's Nuclear Strategy (中国核战略性质与特点分析)," *ibid.*, no. 9 (2006).

⁵³⁹Fravel and Medeiros, "China's Search for Assured Retaliation: The Evolution of Chinese Nuclear Strategy and Force Structure."

⁵⁴⁰He, "On China's Nuclear Policy of Not Using Nuclear Weapons First (论中国“不首先使用核武器”的核战略)."; Yu (荣予) Rong, "An Discussion About Promoting an International Institution on No First Use of Nuclear Weapons (关于推动“不首先使用核武器”国际机制的探讨)," *Peace and Development (和平与发展)*, no. 6 (2009).

⁵⁴¹Jing-Dong Yuan, "Culture Matters: Chinese Approaches to Arms Control and Disarmament," in *Culture and Security: Multilateralism, Arms Control and Security Building*, ed. Keith R. Krause (Portland: Frank Cass Publishers, 1999).

Latin America and the Caribbean on August 21, 1973. As nuclear weapon-free zones became increasingly popular among most developing countries, China has since then become very active in supporting the establishment of nuclear weapon-free zones across the world and has been the most vocal supporter among the P-5, even during the times when it had no other interaction with the international community on nuclear issues.⁵⁴²

The importance of normative consideration in China's nuclear policy-making was also reflected in its attitudes toward the Partial Test Ban Treaty. The Partial Test Ban Treaty in 1963 prohibited the testing of nuclear weapons in the atmosphere, in outer space, and under water. China saw this treaty as highly discriminative and as an effort by the nuclear superpowers—i.e. the United States and the Soviet Union—to deprive the legitimate right of other countries to develop similar capabilities. China's moral recrimination against this “unfair” treaty was so strong that it did not publicly declare it had already stopped atmospheric testing in 1981 and had been fulfilling the obligations under the treaty since. Only after China's political attitudes toward the treaty began to change a few years later, in 1986, did China openly admit that it had already stopped atmospheric testing in 1981.⁵⁴³

However, whether the importance of normative consideration in China's nuclear policy-making has kept at the same level or has decreased, particularly in recent decades, is difficult to accurately evaluate. But there is some evidence suggesting that normative

⁵⁴²Zhu, "The Evolution of China's Nuclear Nonproliferation Policy."; Hui (李慧) Li, "China's Participation in International Nuclear Nonproliferation Institutions: From the Perspective of National Identity (从国家身份视角看中国参与国际核不扩散机制)," *Theoretical Perspective (理论视野)*, no. 9 (2009).

⁵⁴³Baogen (周宝根) Zhou, "China and Global Nuclear Nonproliferation Regime: A Constructivist Analysis (中国与国际核不扩散机制的一种建构主义分析)," *World Economics and Politics (世界经济与政治)* 2(2003).

consideration may have become slightly less important in recent decades. Since the late 1980s and early 1990s, Chinese foreign policy experts, especially those with extensive overseas experience from Western countries, began to argue that China should abandon its traditional priority in defending the “overall benefits of all working people in all countries.”⁵⁴⁴ Between 1949 and the 1980s, promoting internationalism had always been a key element of China’s foreign policy, and it was viewed as shameful to prioritize China’s own national interests over the interests of other “brother countries.” It was only in the early 1990s that this ideology-driven view began to change and a new thinking was accepted that defending China’s own national interests should be the sole priority and the starting point of China’s foreign policy.⁵⁴⁵

This adjustment of the definition of national interests, which is more in line with mainstream Western political thinking, has been gradually accepted by the Chinese nuclear community as well. The emphasis on moral or normative considerations in nuclear policy discussions seems to have decreased, and the nuclear community has become increasingly comfortable with the realist perspective of policy analysis that focuses on maximizing material interests through cost-benefit calculations. At the same time, the George W. Bush administration initiated new efforts to develop new low-yield tactical nuclear weapons such as the Robust Nuclear Earth Penetrator or the Reliable

⁵⁴⁴Xuetong (阎学通) Yan, *Analysis of China's National Interests (中国国家利益分析)*(Tianjin People's Publishing House (天津人民出版社), 1997).

⁵⁴⁵Ibid.; Shuyong (郭树永) Guo, "International Institution Integration and National Interests: A Historical Analysis of China's Foreign Policy (国际制度的融入与国家利益——中国外交的一种历史分析)," *World Economics and Politics (世界经济与政治)* 4(1999).

Replacement Warhead.⁵⁴⁶ The Chinese nuclear community conducted extensive research on these U.S. programs and concluded these were evidence of U.S. motivation to break the established nuclear taboo and to introduce small low-yield tactical nuclear weapons that would be suitable for warfighting on the battlefield.⁵⁴⁷

Such new development took place right after the U.S. Senate rejection of the CTBT in 1999, the U.S. decision to withdraw from the Anti-Ballistic Missile Treaty in 2002 and the U.S. “militarization of space” by developing ballistic missile defense systems. All these developments contributed to China becoming disillusioned with international nuclear arms control norms.⁵⁴⁸ As a result, there is even less evidence for shared normative considerations between the United States and China on nuclear arms control issues.

⁵⁴⁶Jonathan Medalia, "" Bunker Busters": Robust Nuclear Earth Penetrator Issues, Fy2005 and Fy2006" (2005); Robert W Nelson, "Nuclear Bunker Busters, Mini-Nukes, and the Us Nuclear Stockpile," *Physics Today* 56, no. 11 (2003).

⁵⁴⁷Huaqiu (刘华秋) Liu, "The Evolution of U.S. Nuclear Bunk Buster Program (美国核钻地弹计划的来龙去脉)," *Modern Military (现代军事)* 1(2006); Wensheng (李文盛) Li and Tao (梅涛) Mei, "An Overview of the U.S. Development of New Nuclear Bunk Busters (美国发展新型核钻地弹面面观)," *ibid.*8(2001).

⁵⁴⁸lide (葛立德) Ge, "Withdrawal of the United States from the Anti-Ballistic Missile Treaty and the Prospect for the Development of Strategic Missile Defense System (美国退出《反导条约》及战略反导系统的发展前景)," *World Economics and Politics (世界经济与政治)*, no. 4 (2002); Qiangguo (朱强国) Zhu, "Reasons for the U.S. Withdrawal from the Anti-Ballistic Missile Treaty and Its Hidden Strategic Intention (美国退出《反导条约》的动因及潜藏的战略意图)," *Journal of Foreign Affairs College (外交学院学报)*, no. 1 (2005).

CHAPTER FOUR

LONG-TERM OPERATIONAL-LEVEL ENGAGEMENT: NUCLEAR NONPROLIFERATION

The United States and China have conducted an extensive set of engagement programs at the operational level on nuclear nonproliferation issues since the 1980s. This constitutes another case of long-term operational-level engagement between the two countries as these programs took place on a regular basis over more than three decades. Various dialogues, exchanges, visits, and training programs were held to promote in-depth bilateral discussion on nuclear nonproliferation.

Chinese thinking on nonproliferation issues was quite different from mainstream proliferation pessimists' thinking. It was their long-held view that proliferation by "peace-loving countries" contributed to peace and stability. However, long-term engagement managed to promote a bottom-up change of perception, which started with the Chinese nuclear community and ultimately influenced the perception of the top leadership. China recognized the danger of nuclear proliferation and began to see its interests in line with those of the United States. Moreover, training programs provided by U.S. organizations greatly improved China's technical capacity to implement nonproliferation and export control commitments. New common interests were identified during the process but perception of common moral/normative principles faded.

This chapter reviews the development of major engagement programs on issues related to nuclear nonproliferation. It traces the building of technical capacity and change of perception within the Chinese nuclear community as a result of such engagement. It analyzes whether and how this perception change at the operational level was able to influence top-leadership thinking and ultimately change China's official policy regarding nonproliferation. On the issue of strategic trust, it finds that perception change and capacity building led the two countries to find new common interests with each other. However, engagement was not able to change Chinese perception about moral/normative principles behind U.S nonproliferation policy. To the contrary, China attaches less importance to moral/normative considerations in its nonproliferation policy thinking, believing this is what the United States has been doing. Moralistic trust was not built as a result.

Operational-Level Engagement

U.S.-China Arms Control Technical Exchange Program

The U.S.-China Arms Control Technical Exchange Program (ACE) not only served as a very useful communication channel for American and Chinese nuclear scientists to discuss issues related to CTBT (as discussed in chapter two), but it also played a major role in promoting bilateral discussions on nonproliferation issues. Under the ACE program, a series of workshops was organized other with the Chinese Academy of Engineering Physics on subjects such as nuclear materials protection, control, and accounting; export controls; atmospheric modeling; and technical issues related to the

fissile material cutoff treaty.⁵⁴⁹ An important part of the ACE program was the U.S.-China Integrated Demonstration of Nuclear Materials Protection, Control and Accounting (MPC&A), which was started in July 1998.⁵⁵⁰ This joint demonstration between the three U.S. national labs and the China Institute of Atomic Energy (CIAE) took place at the CIAE's Laboratory for Nuclear Safeguards in Beijing. It exhibited some of the most important and advanced nuclear materials safeguard systems, technologies, and equipment.⁵⁵¹ Nuclear scientists from LANL, LLNL, SNL, and CAEP also worked together on a project that ultimately led to the publication of a bilingual primer on the technical issues related to nuclear materials protection, control, and accounting.

One of the workshops jointly organized by LANL, SNL, and CAEP in 1997 was about the role of U.S. scientists in the control of nuclear technologies. The main purpose of this workshop was to introduce to the Chinese nuclear scientists how the American scientists at the national labs have been helping the U.S. government to design and implement nuclear nonproliferation institutions. Experts from LANL and SNL also explained to their Chinese colleagues what an important role they could play in helping the Chinese government to improve its nuclear nonproliferation policy and increase its capability to achieve nonproliferation objectives. According to Nancy Prindle, then project manager for the China Programs in SNL's International Security Initiatives Department, discussion at the workshop included the following issues: the evolution of international committees and control lists, the role of U.S. nuclear scientists in international and

⁵⁴⁹ Marco Di Capua, "The Cox Report and the Us-China Arms Control Technical Exchange Program," *September 1*(1999).

⁵⁵⁰ Ibid.

⁵⁵¹ Hsu, "The Impact of Government Restructuring on Chinese Nuclear Arms Control and Nonproliferation Policymaking."

domestic efforts to decide what to control and how, the role of scientists in reviewing export licenses and in training customs officials, the process for reaching internal technical consensus, and the control of international scientific interactions.⁵⁵²

Bilateral Training Programs

U.S.-China Arms Control Technical Exchange Program

The U.S.-China Arms Control Technical Exchange Program (ACE) was primarily attended by senior American and Chinese nuclear scientists, but it paid special attention to cultivating the growth of next-generation Chinese scientists who would become interested in and familiar with nuclear nonproliferation issues. The need to encourage young scientists to work together with senior experts was very much recognized by both U.S. and Chinese organizers. As a result, a group of junior Chinese scientists was selected to participate in the ACE program.⁵⁵³ Li Bin and Zhang Hui were notable young participants in this program and later became leading experts on nuclear nonproliferation and arms control issues.

Center for Nonproliferation Studies Exchange and Training Programs

The James Martin Center for Nonproliferation Studies (CNS) at the Monterey Institute of International Studies is the largest nongovernmental organization in the United States devoted to research and training on nonproliferation issues. Since 1991, following the collapse of the Soviet Union and the establishment of the Newly Independent States, CNS started the Visiting Fellows Program to offer visiting fellows nonproliferation

⁵⁵²Nancy Prindle, "U.S.-China Lab-to-Lab Technical Exchange Program," *ibid.*, no. Spring-Summer (1998).

⁵⁵³Capua, "The Cox Report and the Us-China Arms Control Technical Exchange Program."

training at the grassroots level and to help raise awareness and promote a deeper understanding of the nonproliferation regime and nonproliferation values.⁵⁵⁴ In the first few years, this Visiting Fellows Program focused mostly on the Newly Independent States, but in 1996 CNS took a significant step in expanding the program beyond the Newly Independent States by establishing the Asia Export Control Fellows Program. The majority of this program's participants actually came from China, including young and midcareer professionals from the Chinese foreign ministry, China customs, and a large number of research institutes and universities.

As the goal of this program was to build and expand a community of policy makers, experts, and educators through education, training, and outreach activities, the program provided these visiting fellows with research, training, dialogue, capacity building, and networking opportunities during their three- to four-month fellowship at Monterey.⁵⁵⁵ The lecture series of this training program included an introduction to nonproliferation threats, nonproliferation regimes, implementation of nonproliferation regulations, and discussion of regional nonproliferation issues. The participants usually took a six-week training course at CNS, a two-week training course at the Center for International Trade and Security at the University of Georgia, and a one-week roundtable with export control practitioners in Washington. Through this program, CNS developed a close working relationship with various Chinese governmental and nongovernmental organizations in

⁵⁵⁴ Margarita Sevcik, "Cns Visiting Fellows Program: Concept of Significant Learning Experience in Nonproliferation Training " (paper presented at the Isa's 49th Annual Convention, Bridging Multiple Divides, San Francisco, CA, 2008).

⁵⁵⁵ Robert Shaw, "The James Martin Center for Nonproliferation Studies: Export Control Outreach Activities in the Asian Region" (paper presented at the 21st Asian Export Control Seminar, Tokyo, Japan, February 26-28, 2014).

the field of nuclear nonproliferation, especially the Department of Arms Control and Disarmament of the Ministry of Foreign Affairs.

In addition, the CNS organized special training programs geared toward specific groups of policy professionals. One example was the China-Washington Intensive Nonproliferation Seminar (WINS). This program brought Chinese officials, experts, and military officers to Washington, DC, to visit government agencies that contribute to nonproliferation policy-making such as the State, Energy, Defense, and Commerce Departments and to conduct informal discussions with their American counterparts on nonproliferation, arms control, and regional security issues.

The Train the Trainer Initiative was another important program that the CNS organized to promote the growth of a nonproliferation expert community in China. This initiative provided training and course materials to Chinese university professors to help them train China's nonproliferation and arms control specialists. Workshops were held in Chinese to help the participants develop introductory arms control and nonproliferation courses, to provide them with teaching materials (in Chinese and English) for new courses or to be incorporated in existing courses, and to train them to use the course materials.⁵⁵⁶ CNS was also instrumental in starting the Tsinghua University Summer Symposium on Arms Control by sending experts to give lectures at the symposium—the first seminar in China to have participants from a broad range of government and nongovernmental organizations and to focus exclusively on arms control and nonproliferation issues.

⁵⁵⁶"Cns Educational Programs," United Nations Officer for Disarmament Affairs, <http://www.un.org/disarmament/education/docs/2002UNStudy/docs/cns.pdf>.

The CNS paid particular attention to training Chinese export control specialists. Its Export Control Fellows Program for Chinese Officials hosts four to six fellows every year from China's export control system for an intensive summer program that focuses on strategic trade controls.⁵⁵⁷ The participants come from different agencies in China's export control system and Chinese universities. Besides this program for Chinese export control officials, the CNS also has the relatively new Industry Fellows Program, which focuses on training export control practitioners in industry.⁵⁵⁸

Center for International Trade and Security Exchange and Training Programs

The Center for International Trade and Security (CITS) at the University of Georgia has a special focus on developing nonproliferation training programs in collaboration with Chinese nonproliferation and export control organizations. CITS hosts two annual training programs on China. One is an annual executive training in the United States for Chinese industry representatives on strategic trade control and business administration. The second is the Ministry of Commerce Fellowship program. Each year Chinese government representatives from licensing agencies come to CITS for specific trainings on export control. Participants from both training programs also have opportunities to have visits and meetings with U.S. policy makers and industry executives to exchange ideas and share best practices.

The CITS also organized two industry outreach events in China every year in addition to a number of training programs for corporations. The Chinese co-organizers include the

⁵⁵⁷"East Asia Nonproliferation Program," James Martin Center for Nonproliferation Studies (CNS) <http://www.nonproliferation.org/about-2/programs/east-asia/>.

⁵⁵⁸"The James Martin Center for Nonproliferation Studies: Export Control Outreach Activities in the Asian Region."

Ministry of Commerce (MOFCOM), the Chinese Academy of International Trade and Economic Cooperation (商务部国际贸易经济合作研究院), the State Nuclear Security Technology Center (国家核安保技术中心), and China Arms Control and Disarmament Association. The American instructors come from not only CITS but also from U.S. government agencies and corporations. The CITS has also been in cooperation with Chinese organizations such as the Central Finance and Economics University and China Reform Forum through the U.S. China New Relationship Colloquium to study economic and security issues and provide policy recommendations. Table 12 summarizes the Chinese partners of CITS's training programs and their cooperative training areas.

Table 12 CITS's China Exchanges and Training Programs and Its Chinese Partners

Chinese Partners	Areas of Exchanges and Trainings
Ministry of Commerce	Sponsored CITS workshops in China; every year sends Chinese government officials to study with CITS in Athens and Washingtonas MOFCOM Fellows
Chinese Academy of International Trade and Economic Cooperation	Training programs for Chinese corporations
China Arms Control and Disarmament Association	US-China Working Group on Strategic Trade; collaboration on industry outreach
China Foreign Affairs University	Faculty exchange on international trade and global security
China North Industries Corporation	Employee training on strategic trade control; co-development of internal export control compliance program
Chinese People's Association for Peace and Disarmament	Hosts CITS' China visits and exchange programs
State Nuclear Security Technology Center	US-China Working Group on Strategic Trade; collaboration on industry outreach
Tsinghua University	Cooperation in CITS workshops and industry outreach
Fudan University	Hosts CITS' visits; cooperation in lecture series

The CITS's training programs and outreach activities have greatly helped raise awareness of Chinese corporations about the importance of nonproliferation and export control issues. Many of the defense companies that have received training from CITS begin to set up dedicated programs on export oversight and reviews. For instance, the China North Industries Corporation (北方工业公司, English name: Norinco), one of China's biggest defense manufacturing and trade companies, has become interested in recent years to

sponsor next-generation training and exchange programs to provide opportunities for next-generation scholars to study nonproliferation and export control issues and to network with international business leaders and officials on security policy discussions.⁵⁵⁹

U.S.-Chinese Engagement at Multilateral Dialogues

Council for Security Cooperation in the Asia Pacific Meetings

The Council for Security Cooperation in the Asia Pacific (CSCAP) was established in 1993 as a nongovernmental process that promotes and organizes Track II dialogues in the Asia Pacific region on security issues. The U.S. think tank Pacific Forum played a leading role in the formation of CSCAP and also manages the U.S. committee (USCSCAP). CSCAP has member committees in almost all the countries in the region including the United States, China, Japan, Australia, South Korea, North Korea, Canada, and all of the ASEAN (Association of Southeast Asian Nations) countries, among others. CSCAP has several study groups to address some of the most pressing security issues in the region. The CSCAP Study Group on Countering the Proliferation of Weapons of Mass Destruction (WMD Study Group) and CSCAP Export Controls Experts Group (XCXG) are two of the most active study groups.⁵⁶⁰ American participants of these meetings are mostly international security scholars, analysts, corporate executives, and current and former government officials with expertise in Asia-Pacific security

⁵⁵⁹"Cits in China," Center for International Trade and Security (CITS), University of Georgia <http://cits.uga.edu/programs/china>.

⁵⁶⁰"Study Groups, Council for Security Cooperation in the Asia Pacific," <http://www.cscap.org/index.php?page=study-groups>.

issues.⁵⁶¹ The Chinese participants are analysts, scholars, and former government and military officials with expertise in nonproliferation and export control issues. All of the American and Chinese participants attended the meetings in a private capacity, but many of them have close connections with their governments through organizational affiliations and personal ties. For instance, frequent Chinese participants included retired admiral Yang Yi and experts such as Su Hao and Wang Haihan who work for the Foreign Ministry's think tank. The CSCAP general conferences and study group meetings have provided opportunities for these experts to conduct extensive exchanges on WMD nonproliferation and export control issues not only in the Asia-Pacific region but also in the U.S.-Chinese bilateral context. Tables 13 and 14 summarize the WMD Study Group and XCXG meetings in the last decade.

⁵⁶¹"U.S. Member Committee (Uscscap), Council for Security Cooperation in the Asia Pacific (Cscap)," (Honolulu: Pacific Forum, CSIS).

Table 13 Meetings of the CSCAP Study Group on Countering the Proliferation of Weapons of Mass Destruction (WMD Study Group) since 2005

Date of Study Group Meeting	Place of Meeting
27-28 May 2005	Singapore
2-3 December 2005	Manila, Philippines
26-27 March 2006	Singapore
27-29 November 2006	Danang, Vietnam
11-13 February 2007	San Francisco, USA
9-10 December 2007	Jakarta, Indonesia
26-27 May 2008	Ho Chi Minh City, Vietnam
23-24 January 2009	Bangkok, Thailand
29-30 June 2009	Beijing, China
7-8 December 2009	Hanoi, Vietnam
2-3 July 2010	Singapore
16-17 December 2010	Ho Chi Minh City, Vietnam
21-22 February 2011	Las Vegas, USA
18-19 November 2011	Hanoi, Vietnam
6-7 March 2012	Sydney, Australia
6-8 November 2012	Ho Chi Minh City, Vietnam
2-3 June 2013	Manila, Philippines

Table 14 Meetings of the CSCAP Export Controls Experts Group (XCXG) since 2005

Date of Study Group Meeting	Place of Meeting
7-8 November 2005	Tokyo, Japan
11-12 May 2006	Beijing, China
9-10 February 2007	Tokyo, Japan
25-26 August 2008	Manila, Philippines
9-10 December 2009	Hanoi, Vietnam
23-24 October 2012	Manila, Philippines

The meetings have helped the participants to obtain better knowledge of one another's thinking behind their respective policies and to build common understanding on specific

policy issues. On one of the recent meetings, for example, participants clarified their different understanding regarding UN Security Council Resolution 1540, which focuses on non-state actors. It does not impose penalties for noncompliance and other UN sanctions resolutions, which mostly focus on national states and contain articles for noncompliance penalties. The participants were also able to jointly draft a memorandum that establishes principles and recommends measures for better implementation of Resolution 1540.⁵⁶² The issues discussed at the earlier meetings were very general and conceptual such as global nonproliferation order and nonproliferation norm.⁵⁶³ The participants were able to point out concerns such as the need to adapt nonproliferation norms to the unique characteristics of the Asia-Pacific region but usually could not agree on what specific steps to take.⁵⁶⁴ As the meetings continued, the issues discussed became increasingly in-depth and specific and participants were able to reach agreement on a wider range of substantive policy issues such as fissile material management and nuclear security, regulatory framework and control list in strategic good management, and transshipment points and foreign trade zones in export control.⁵⁶⁵ The common understandings reached at these study group meetings also feed into official-level

⁵⁶²"17th Meeting of the Cscap Study Group on Countering the Proliferation of Weapons of Mass Destruction (Wmd): Chairman's Report," (The Peninsula Manila, Manila, Philippines: Council for Security Cooperation in the Asia Pacific (CSCAP)).

⁵⁶³"Chairman's Report of the First Meeting of the Cscap Study Group on Countering the Proliferation of Weapons of Mass Destruction," (Singapore: Council for Security Cooperation in the Asia Pacific May 27-28 2005); "Second Meeting of the Cscap Study Group on Countering the Proliferation of Weapons of Mass Destruction," (Manila, Philippines: Council for Security Cooperation in the Asia Pacific December 2-3 2005).

⁵⁶⁴"Chairman's Report of the First Meeting of the Cscap Study Group on Countering the Proliferation of Weapons of Mass Destruction."

⁵⁶⁵"17th Meeting of the Cscap Study Group on Countering the Proliferation of Weapons of Mass Destruction (Wmd): Chairman's Report."; "Meeting of the Council for Security Cooperation in the Asia-Pacific (Cscap) on Managing Trade of Strategic Goods and Technologies: Chairman's Report," (New World Hotel, Manila, Philippines: Council for Security Cooperation in the Asia Pacific (Cscap), October 22-24, 2012).

meetings such as the ASEAN Regional Forum Inter-Sessional Meeting on Non-Proliferation and Disarmament (ARF ISM/NPD)⁵⁶⁶

Community Expansion and Capacity Building

American organizations and institutes played a significant role in building and growing China's nuclear nonproliferation specialists community. U.S. foundations and organizations provided funding for a large number of Chinese training programs on nuclear nonproliferation and provided important experts with support for these training programs. The Tsinghua University Summer Symposium on Arms Control, for example, was fully funded by the Ford Foundation, the Ploughshares Fund, and the MacArthur Foundation. The CNS, CITS, and Union of Concerned Scientists sent many experts to give lectures and provide training at these symposia. The Summer Symposium was the first in China to have a heavy focus on nonproliferation issues. It provided a comprehensive introduction to nonproliferation issues to a large number of young Chinese experts and analysts from all the major government agencies, research institutes, and universities. There were also site visits to government agencies that are responsible for China's nonproliferation policy-making or policy implementation, which provided opportunities for the participants to build connections and helped to break bureaucratic barriers among these relatively isolated agencies.

U.S. government agencies, particularly the Department of Commerce, have also played an important role in developing and sponsoring operational-level training programs on nonproliferation in China. The U.S. Department of Commerce and MOFCOM co-

⁵⁶⁶"17th Meeting of the Cscap Study Group on Countering the Proliferation of Weapons of Mass Destruction (Wmd): Chairman's Report."

organized bilateral conferences on export controls. They also held joint U.S.-China Customs seminars on WMD export controls. This was attended by Chinese customs officials who then went to the United States for training on WMD export control issues.⁵⁶⁷

Such U.S.-initiated and sponsored training programs have proved very effective in raising interest and attention in Chinese government on improving their bureaucratic capacity to make and implement nonproliferation policies. Since the early 2000s, the Chinese government has been active in developing and sponsoring its own training programs. As the Ministry of Commerce takes the lead, a number of Chinese government agencies and nongovernmental organizations have sponsored and organized a variety of training programs. COSTIND, China Atomic Energy Agency (CAEA), and China General Administration of Customs have all played important roles in these training programs that are primarily aimed at educating Chinese local government officials and corporate officials on relevant laws and regulations over nuclear nonproliferation. In 2003, MOFCOM organized the first nationwide WMD export control seminar, which was attended by local officials from MOFCOM's provincial departments. Additional provincial-level seminars have also been held.

COSTIND, whose subordinate organizations have been heavily involved in various U.S.-China nuclear dialogues, is also a very active actor in promoting nonproliferation education and training in China. It convenes seminars on China's nonproliferation policies and regulations and invites officials from other government agencies to give

⁵⁶⁷ Evan S Medeiros, *Chasing the Dragon: Assessing China's System of Export Controls for Wmd-Related Goods and Technologies*(Rand Corporation, 2005).

lectures and presentations. Since COSTIND coordinates the operation of many Chinese defense industry companies, it is in a good strategic position to reach out to China's defense industry on nonproliferation education. COSTIND also has a large number of offices and bureaus at various levels of the local government, which also play an important role in raising awareness on nonproliferation among local defense enterprises and provide them with nonproliferation training.

The training programs raised attention in recent years in major state-owned enterprises, which began to dedicate specific offices and personnel to handle the issue of nonproliferation and export control. The China North Industries Corporation, for example, has established a small export-control research bureau within its Systems Research Institute.⁵⁶⁸ This bureau conducts research about the role of industry in the American export control system and provides recommendations for improving the company's own export review and control procedures. The company also set up an Export Control Committee and an Export Control Office that has a veto power over export decisions. It incorporates an automatic screening mechanism into its export review procedure by establishing three internal review databases, including the sensitive countries database, the sensitive clients database, and the sensitive products database. The Export Control Office organizes various training programs for its employees at different levels and seeks regular consultation with relevant Chinese government agencies, nongovernmental organizations, and individual nonproliferation experts for information and advice.⁵⁶⁹ The existence of nonproliferation education, training, and implementation programs at the

⁵⁶⁸*Ibid.*

⁵⁶⁹Yulin (植玉林) Zhi, "Principles of Nonproliferation Export Control and Internal Export Self-Regulation (关于防扩散出口管制和内部出口自律原则)," (China North Industries Corporation (中国北方工业公司), 2014).

company level indicates a further deepening and broadening of China's nonproliferation capacity building. It is now a common understanding within these companies that it is not only their obligation and responsibility under the law to strictly implement the government's export control policies but also a crucial precondition for them to win international reputation and credibility and to sustain their global market.⁵⁷⁰

U.S.-Chinese nuclear exchanges also helped China build its capacity on nuclear nonproliferation-related technology development. The China Institute of Atomic Energy (CIAE), for example, was among the first Chinese civilian nuclear energy research institutes to be involved in U.S.-Chinese nuclear exchanges. Since 1984, a number of nuclear scientists from CIAE were trained in Los Alamos National Laboratory to develop nuclear measurement instrumentation and safeguards systems technologies that would help support China's implementation of its nonproliferation commitments.

Such technical training and cooperation interaction was supported by the U.S. Department of Energy. Under this bilateral program, Chinese scientists and officials were invited to attend the DOE State Systems of Accounting and Control (SSAC) course. Chinese safeguard scientists were also invited for long-term visits (one to two years) at Los Alamos in the safeguards assay and the safeguards systems groups in the Nonproliferation and International Security Division. During their visits, Chinese scientists studied and worked on nondestructive assay (NDA) instrumentation and systems techniques that were used by IAEA inspectors. Some Chinese scientists also spent time at the Brookhaven National Laboratory. In addition, this program provided

⁵⁷⁰ Personal correspondence with export control officers from Chinese defense manufacture and trade companies, 2012, 2013.

visiting Chinese scientists with opportunities to participate in technical conferences such as the annual meetings of the Institute of Nuclear Materials Management (INMM).⁵⁷¹

In reciprocity, U.S. nuclear safeguards experts paid visits to China and interacted with a large number of Chinese nuclear institutes. They gave lectures and presentations and held discussions on nuclear materials control and accountability, nondestructive assay safeguards instrumentation, and IAEA safeguards. Chinese scientists from CIAE, the Beijing Institute of Nuclear Engineering (BINE), and officials from the Government Safeguards Office participated in these extensive exchanges and discussions. Table 15 provides a summary of the major visits and exchanges between Los Alamos and Chinese scientists during the late 1980s and early 1990s.

⁵⁷¹George W. Eccleston, "Summary of Safeguards Interactions between Los Alamos and Chinese Scientists," (Los Alamos National Laboratory Report, LA-UR 94-1395, April 20, 1994).

Table 15 Major Visits and Exchanges between Los Alamos and Chinese Scientists during the Late 1980s and Early 1990s⁵⁷²

Time	Highlight of Activities
September 1984	G. R. Keepin visited China as a member of an INMM delegation. Chinese expressed interest in participating in a DOE-SSAC training course.
June 1985	H. Zhuang and Jiang Jincai were the first Chinese attendees at the SSAC course held in Santa Fe, NM, and San Clement, CA
September 1986	As a result of SSAC attendance, Arnie Hakkila presented an invited lecture on destructive analysis for safeguards at the International Conference on Nuclear Radiochemistry in Beijing, China
Fall 1987	Professor Sun Zuxun, President of the Institute of Atomic Energy, visits Los Alamos. As part of the visit, Sun discussed technical exchanges on safeguards between Los Alamos and CIAE. (In 1983, Sun had previously spent a year in Los Alamos as a visiting scientist at Los Alamos Meson Physics Facility.)
April 1987	Professor Zhu Rongbao, Z. Q. Luo, and W. Wang attended the DOE SSAC course in Santa Fe, Los Alamos, and Richland, WA.
September 1987	Dr. T. K. Li and Mr. W. Kirk from Los Alamos participated in the 6 th Pacific Basin Conference on Nuclear Energy in Beijing. During the visit Dr. Li presented lectures on safeguards NDA to CIAE scientists. He also visited the Chinese Academy of Sciences in Beijing to discuss application of nuclear detection techniques.
September 1987 – March 1988	Professor Zhu spent 19 months in the United States, first visiting Brookhaven and then Los Alamos. At LANL, Zhu concentrated on NDA physics for safeguards. He established an NDA safeguards group on his return to CIAE.

⁵⁷²Ibid.

Table 15continued:

May 1989	Mr. L. Yang and Mr. D. Yang participated in the DOE SSAC course in Santa Fe, Los Alamos, and Richland, WA.
May 1989 – June 1991	Professor Qiao visited Los Alamos for two years to learn safeguards NDA technology. He became the deputy group leader for safeguards NDA when he returned to CIAE.
November 1989 – December 1989	Dr. Howard Menlove, Los Alamos Fellow, visited CIAE for six weeks as an IAEA Fellow to provide lectures and to assist the Chinese in safeguards NDA instrumentation development.
November 1990	Dr. Hakkila lectured on safeguards systems design and safeguards for reprocessing plants. He visited Qinshan nuclear power plant and discussed the implications of IAEA safeguards on the power station.
May 1991	Mr. Jiang Zhu, Q. Liu, and H. Wang participated in the DOE SSAC course in Santa Fe, Los Alamos, and Richland, WA.
November 1991	Dr. R. Augustson visited China as an invited lecturer on the design and application of NDA instrumentation to safeguards.
May 1991 – January 1992	Mr. Jiang Jincai visited Los Alamos to learn safeguards systems design methodology. The Los Alamos MAWST code for statistical evaluation of safeguards data was provided to the CIAE as part of this visit. Mr. Jiang returned to the United States in 1992 as a student at Texas A&M working toward a PhD in nuclear engineering.
May 1992	Dr. Hsue from Los Alamos attended the Pacific Basin Conference on Nuclear Energy in Beijing. Following the conference he visited the CIAE and presented lectures on safeguards and NDA instrumentation.
January 1993 - 1994	Mr. Yang visited Los Alamos studying NDA methods for safeguards applications.
June 1994	Dr. Eccleston visited CIAE with John Rooney and provided a series of lectures on safeguards and NDA instrumentation.

Such mutual interaction had a significant impact on building China's nuclear safeguards expertise. Chinese scientists laid the foundation of the safeguards program at CIAE for China after returning from these extended visits and exchanges at U.S. national laboratories. They also became China's dominant nuclear safeguards experts. Professor Zhu Rongbao, for example, after returning from an eighteen-month visit and study in the United States, headed CIAE's first safeguards group in 1991. This CIAE safeguards group later expanded to a section that had been in charge of China's NPT compliance and had played an important role in advising the Chinese government on nuclear nonproliferation policies and safeguard issues. In 1995, CIAE set up the Technical Research Laboratory for Nuclear Safeguards that has been used to conduct research on nuclear safeguards technology, provide training on materials accounting to operators of Chinese nuclear facilities, and support inspections for domestic nuclear material control.⁵⁷³ Based on the training received from the United States, Chinese scientists at CIAE also developed a number of nondestructive assay instruments and technologies including the Neutron Coincidence Counter, the Active Neutron Coincidence Collar, the Segmented Gamma Scanner, the Delayed Neutron Shuffler, and the Hybrid Densitometer, which greatly contributed to China's nuclear safeguards research and implementation capability.

As was the case for nuclear arms control, U.S.-Chinese nuclear dialogues and exchanges also raised interest among Chinese think tanks, research institutes, and universities to pay

⁵⁷³Hsu, "The Impact of Government Restructuring on Chinese Nuclear Arms Control and Nonproliferation Policymaking."

attention to studying international nuclear nonproliferation issues and China's nuclear nonproliferation policies. Since the late 1980s, these Chinese experts began to rethink China's traditional attitudes toward nuclear nonproliferation. They raised the dangers of nuclear proliferation and analyzed the potential security, foreign policy, and economic problems that nuclear proliferation might pose to China.⁵⁷⁴ They were the first to systematically introduce the international nuclear nonproliferation regime to a broad Chinese domestic audience.⁵⁷⁵ Their research on the U.S. nuclear nonproliferation policy and nuclear export control system offered practical policy recommendations for Chinese decision makers on how to improve its domestic control over sensitive nuclear technology.⁵⁷⁶

These Chinese experts established China's first research centers on nonproliferation issues. The Arms Control and Nonproliferation Research Center at the Chinese Academy of Social Sciences has organized a variety of nonproliferation workshops, seminars, and research meetings that effectively promoted interagency communication among different

⁵⁷⁴Zhiyong (于智勇) Yu, "Rethinking Some of the Issues Related to the Nuclear Nonproliferation Treaty (关于《核不扩散条约》若干问题的再认识)," *World Economics and Politics* (世界经济与政治) 6(1988); Yunhua (邹云华) Zou, "Non-Proliferation of Nuclear Weapons - an Observation on the Eve of the Fourth Npt Review Conference (不扩散核武器——写在《不扩散核武器条约》缔约国第四次审议会议之前)," *International Studies* (国际问题研究), no. 03 (1990); Zhijian (黄志坚) Huang, "Nuclear Proliferation: An Issue That Is Raising Increasing International Attention (核扩散——一个日益引起世人关注的问题)," *World Economics and Politics* (世界经济与政治) 7(1992); Liping (夏立平) Xia, "An Preliminary Analysis on Contemporary Nuclear Proliferation in the Asian-Pacific Region (浅析当前亚太地区的核扩散)," *International Society and Economy* (国际社会与经济) 6(1994).

⁵⁷⁵Ling (王玲) Wang, "An Introduction of the International Nuclear Nonproliferation Regime (国际防止核扩散体制简介)," *International Data and Information* (国际资料信息) 11(1994).

⁵⁷⁶Mingquan (朱明权) Zhu, "Preventing Nuclear Nonproliferation: The U.S. Export Control Regime and Its Limits (防止核扩散: 美国的出口控制机制及其局限)," *Fudan Journal (Social Sciences Edition)* (复旦学报: 社会科学版) 4(1993); "Another Analysis of the Nuclear Nonproliferation Policy of the United States: Dilemma and Obstacle (再论美国的防止核扩散政策: 矛盾和困境)," *ibid.* 2(1995).

Chinese government agencies, industry sectors, and research institutes.⁵⁷⁷ The China Arms Control and Disarmament Association (CACDA), drawing expertise from a wide range of Chinese organizations, has a particular focus on nonproliferation policy research and training. CACDA has more than thirty corporate members who are engaged in research on issues of international security, arms control, and nonproliferation, including China's Institute of International Studies, the Chinese People's Association for Peace and Disarmament, the China Institute of Contemporary International Relations, and the Foundation for International Strategic Studies, among others. Its more than 200 individual members include scientists and experts working in the areas of weapons development and nonproliferation research. Additional expertise is provided by retired Chinese diplomats and former military officials. CACDA has formed a task force to study export control practices in Western countries and to draw lessons for improving China's nonproliferation and strategic trade management system.⁵⁷⁸ It also sponsors a very large number of seminars and workshops in China to promulgate China's nonproliferation policy, law, and regulations and reaches out to China's defense enterprises and civilian companies to promote nonproliferation education and improve export control policy implementation.⁵⁷⁹

⁵⁷⁷Fan, "Summary of American Arms Control and Nonproliferation Policy Workshop ("美国军控与防扩散政策研讨会" 综述)."; Hengyang (李恒阳) Li, "Summary of Nuclear Security and Regional Nonproliferation Situation Workshop ("核安全与地区防扩散形势" 研讨会综述)," *ibid.*2(2012).

⁵⁷⁸Medeiros, *Chasing the Dragon: Assessing China's System of Export Controls for Wmd-Related Goods and Technologies*.

⁵⁷⁹"Industry Nonproliferation Self-Compliance and Self-Discipline Workshop Was Held in Dalian (企业防扩散自律合规研讨班在大连举办)," (Dalian, Liaoning: China Arms Control and Disarmament Association (中国军控与裁军协会), Chinese Academy of International Trade and Economic Cooperation (商务部国际贸易经济合作研究院), Centre for Science and Security Studies, King's College London, November 29-30, 2012); "Arms Control and Nonproliferation Training Symposium Was Held in Beijing (军控防扩散培训班在京召开)," China Arms Control and Disarmament Association (中国军控与裁军协会), State

Operational-level engagement with the United States has greatly improved the Chinese government's capability to effectively carry out its nuclear nonproliferation and export control policies. In the 1980s, China's bureaucratic weakness in implementing nuclear export control regulations greatly undermined the effectiveness of its nonproliferation policy. The Ministry of Foreign Affairs, for instance, lacked appropriate technical expertise in understanding and implementing nonproliferation policies and usually sought to respond to complicated nonproliferation compliance issues through general political and diplomatic principles. There was also a lack of effective coordination mechanisms among relevant government agencies, the military, and the defense industry.⁵⁸⁰ During 1982 to 1987, China exported more than 100 tons of heavy water to unsafeguarded facilities in India, which was apparently a policy mistake because China would not have wanted to help India—China's primary rival in South Asia—with its nuclear weapons program.⁵⁸¹ In 1995, the China Nuclear Energy Industry Corporation (CNEIC, 中国原子能工业公司), a subsidiary company of the China National Nuclear Corporation (CNNC, 中国核工业集团公司) exported about 5,000 specially designed ring magnets to an unsafeguarded Pakistani nuclear laboratory that was allegedly involved in nuclear weapons work. It turned out that the CNEIC had arranged the sale without the full awareness or consent of the Chinese central government.⁵⁸²

Administration for Science, Technology and Industry for National Defense (国家国防科技工业局), <http://www.cacdacn.org/a/xiehuihuodong/20111223/1299.html>.

⁵⁸⁰Zhang, *China's Changing Nuclear Posture: Reactions to the South Asian Nuclear Tests*.

⁵⁸¹"China's Nuclear Exports and Assistance to South Asia," Center for Nonproliferation Studies, Monterey Institute of International Studies http://cns.miis.edu/archive/country_india/china/nsaspos.htm.

⁵⁸²Jing-Dong Yuan, "The Evolution of China's Nonproliferation Policy since the 1990s: Progress, Problems, and Prospects," *Journal of Contemporary China* 11, no. 31 (2002).

During operational-level engagement with the United States, American experts and policy practitioners helped their Chinese colleagues to develop a few measures to address their bureaucratic weakness. They helped Chinese colleagues to change their focus from administrative actions to a law-based legal management approach of handling export control issues. The Chinese government has a well-known tradition of relying on administrative action to implement policy and rein in sub-state actors. This was also the case with its original approach toward nuclear export control.⁵⁸³ This tradition of using informal administrative action rather than clearly defined and published laws and regulations, however, began to change, as China began to understand the advantages of the U.S. model of relying on export control laws to regulate sub-state actors. Chinese experts and analysts conducted in-depth research about the U.S. model and promoted the change of approach by the government.⁵⁸⁴ In recent years, the Chinese government has shown increasing appreciation of the importance of export control laws in managing the export of domestic companies and has established a number of nuclear export control related laws and legal regulations.⁵⁸⁵ Table 16 in the next section provides a summary of

⁵⁸³Hsu, "The Impact of Government Restructuring on Chinese Nuclear Arms Control and Nonproliferation Policymaking."

⁵⁸⁴Taichen (刘泰尘) Liu, "The U.S. High-Tech Export Control (美国的高技术出口管制)," *Contemporary International Relations (现代国际关系)* 3(1990); Lixin (许立新) Xu, "The Legal System of China's Foreign Trade Management and Export Control (我国对外贸易管理与出口管制法律制度)," *China's Foreign Trade (中国对外贸易)*, no. 1 (2000); Jianjun (张建军) Zhang, "A Comparative Analysis of U.S. And Chinese Legal System Regarding Technology Export Management (中美技术出口管理法律制度的比较研究)" (Northwestern University (西北大学), 2004); Zhao (赵召) Zhao, "Lessons from the U.S. Export Control Legal Reform (美国出口管制法律改革的启示)," *Economy (经济)*, no. 3 (2012).

⁵⁸⁵"Regulations of the Prc on the Control of Nuclear Dual-Use Items and Related Technologies Export (中华人民共和国核两用品及相关技术出口管制条例)," *Gazette of the State Council of the People's Republic of China (中华人民共和国国务院公报)*, no. 09 (2007); "State Council Decision to Revise the Regulations of the Prc on the Control of Nuclear Export (国务院关于修改《中华人民共和国核出口管制条例》的决定)," *Gazette of the Commission of Science, Technology and Industry for National Defense of the People's Republic of China (中华人民共和国国防科学技术工业委员会文告)*, no. 01 (2007); "Regulations of the Prc on the Control of Nuclear Export (中华人民共和国核出口管制条例)," *Gazette of the State Council of the People's Republic of China (中华人民共和国国务院公报)*, no. 01 (1997).

the laws and regulations established by China on nuclear-related or dual-use export controls in recent years.

Through bilateral engagement, the United States was also able to persuade the Chinese to embrace the “catch-all” principle for export control and to adopt end-use/end-user controls. MOFCOM and the Ministry of Public Security (MPS) had little experience in investigating export control violations. They usually relied on the claims submitted by Chinese companies regarding the end-use and end-users of the intended sales and lacked a tradition of healthy skepticism when reviewing export applications.⁵⁸⁶ Increased interactions with American trainers and policy practitioners helped Chinese officials from export control enforcement agencies to address the insufficiency in their investigative culture. Chinese officials used to rely on the information submitted by export license applicants for judging the proliferation risks of the exporting items. American trainers have encouraged Chinese officials to set up cross-checking databases and to use relatively sophisticated investigative methods for identifying inconsistencies in export applications. Chinese export reviewers learned from the American catch-all controls, which increased government oversight over not only items on explicit control lists but also dual-use items not on existing control lists but may be suspected to be intended for nuclear weapon end-use or end-users.⁵⁸⁷ By the early 2000s, China set up specific regulations regarding the proof of end-use/end-users of the intended exports. Such regulations require exporters to provide different types of proofs of end-use/end-users

⁵⁸⁶ Medeiros, *Chasing the Dragon: Assessing China's System of Export Controls for Wmd-Related Goods and Technologies*.

⁵⁸⁷ Dennis Krepp, "Implementing Catch All Controls: A Risk Assessment-Based Approach toward Nonproliferation," (Office of National Security and Technology Transfer Controls, U.S. Department of Commerce, 2012).

according to the sensitivity of the exported items. Besides these proofs, the end-users also need to explicitly pledge not to use China-imported items in any purposes other than the certified end-use or to transfer the items to any third party without permission from the Chinese government.⁵⁸⁸

The growth of China's nuclear nonproliferation specialists community also made it possible for the government to tap into a pool of expertise to support its nonproliferation and export control decision-making. The government created a group of about two hundred ad hoc technical experts from various government agencies and nongovernmental organizations. This independent panel of technical experts provided technical advice and recommendations in terms of risk assessment and export application reviews.⁵⁸⁹ All these developments have significantly contributed to the building of a more systemic, better coordinated, and more technically capable nuclear nonproliferation and export control system. Figure 10 shows China's nuclear export control system in 2013. All the major organizations in this system have been greatly benefited from U.S.-Chinese cooperative training programs. Note that the previous Commission of Science, Technology, and Industry for National Defense (COSTIND) was transformed into the State Administration for Science, Technology and Industry for National Defense (SASTIND) and put under the administration of the Ministry of Industry and Information Technology in 1998. The organizations in grey are those that play a consulting role in the system.

⁵⁸⁸"China's Non-Proliferation Policy and Measures (中国的防扩散政策和措施)," (Beijing: State Council Information Office (国务院新闻办公室), 2003).

⁵⁸⁹*Ibid.*; Medeiros, *Chasing the Dragon: Assessing China's System of Export Controls for Wmd-Related Goods and Technologies*.

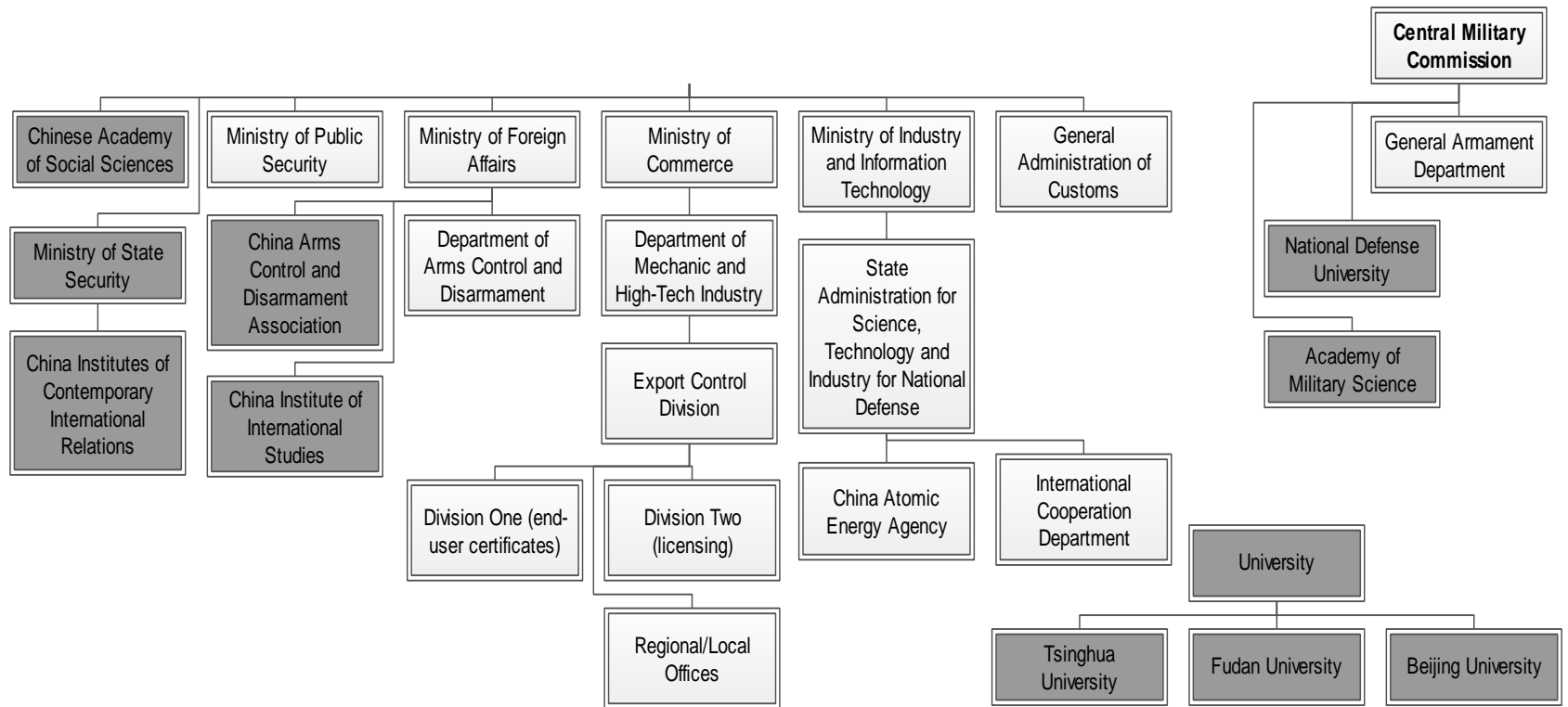


Figure 10 China's Nuclear-Related and Dual-Use Export Control Organization Chart, 2013⁵⁹⁰

⁵⁹⁰ There are many Chinese universities that are conducting research or have programs on nuclear nonproliferation. The table only lists three of them as examples.

Bottom-Up Influence and Perception Change

In one of the workshops co-organized by Sandia National Laboratory, Los Alamos National Laboratory, and the China Academy of Engineering Physics, a Chinese participant from CAEP stated, “We now have a clear picture of the function between the U.S. government, labs, and technical experts.” When it came to the role of Chinese scientists and experts in China’s nuclear policy-making, he offered this frank observation: “We are the nuclear weapons experts in China who know the critical technologies; the government has to listen to us.”⁵⁹¹

When it comes to the issue of nuclear arms control and nonproliferation, it seems indeed the case that the Chinese nuclear community has played a critical role in introducing American thinking, learning, and internalizing the American model of conducting nuclear nonproliferation and changing the understanding and attitudes toward nuclear nonproliferation at the top leadership level. During this process, the various American-sponsored and organized dialogues, exchanges, and training programs greatly contributed to the growth and expansion of China’s nuclear nonproliferation specialists community that then started the change of perception in China in a largely bottom-up process. Chinese fellows and graduates from the Center for Nonproliferation Studies’ nonproliferation training programs, for example, were promoted to senior positions in government ministries. Many of them represented China at NPT Review Conferences, NPT Preparatory Committee meetings, various IAEA conferences, CD meetings, and other high-level nonproliferation functions.

⁵⁹¹Prindle, "U.S.-China Lab-to-Lab Technical Exchange Program."

Traditional Chinese Perception toward Nuclear Nonproliferation

There are two schools of thinking in the West about nuclear nonproliferation. One school believes that nuclear proliferation has a negative impact on international security and stability. "Because of common biases, inflexible routines, and parochial interests," deterrence might fail and nuclear conflicts could break out.⁵⁹² Even if nuclear weapons are not used in international conflicts, more countries will obtain nuclear weapons and the more dangerous the world will become because nuclear weapons encourage aggressive behavior.⁵⁹³ Nuclear proliferation is seen as responsible for increasing international tension, making it more difficult to maintain peace and stability and making comprehensive and complete disarmament less likely to be achieved.⁵⁹⁴ The second school has a more optimistic view of the consequences of nuclear proliferation. Scholars such as Kenneth Waltz, Bruce Bueno de Mesquita, John Mearsheimer, and Stephen Van Evera have stronger faith in the robustness of deterrence and see proliferation contribute to the maintenance of peace.⁵⁹⁵ With that said the policy community in the United States generally embraces a more pessimistic view about nuclear proliferation and has reached a general consensus that preventing the spread of nuclear weapons is one of the top

⁵⁹²Scott D Sagan, "The Perils of Proliferation: Organization Theory, Deterrence Theory, and the Spread of Nuclear Weapons," *International Security* (1994).

⁵⁹³S Paul Kapur, *Dangerous Deterrent: Nuclear Weapons Proliferation and Conflict in South Asia*(NUS Press, 2009).

⁵⁹⁴George Bunn, "The Nuclear Nonproliferation Treaty: History and Current Problems," *Arms Control Today* 33, no. 10 (2003); Joseph S Nye, "Maintaining a Nonproliferation Regime," *International Organization* 35, no. 1 (1981); Bradley A Thayer, "The Causes of Nuclear Proliferation and the Utility of the Nuclear Non-Proliferation Regime," *Security Studies* 4, no. 3 (1995).

⁵⁹⁵Scott Douglas Sagan and Kenneth Neal Waltz, *The Spread of Nuclear Weapons: A Debate*(WW Norton New York, 1995); Bruce Bueno De Mesquita and William H Riker, "An Assessment of the Merits of Selective Nuclear Proliferation," *Journal of Conflict Resolution* 26, no. 2 (1982); Mearsheimer, "Back to the Future: Instability in Europe after the Cold War."; Stephen Van Evera, "Primed for Peace: Europe after the Cold War," *ibid.*; Barry R Posen, "The Security Dilemma and Ethnic Conflict," *Survival* 35, no. 1 (1993).

priorities of U.S. foreign policy.⁵⁹⁶ Over the past few decades, the United States has played a leading role in the world in preventing nuclear proliferation. This U.S. policy is, however, opposite the Chinese traditional understanding of nuclear proliferation.

Mao Zedong, the ultimate decision maker for China's nuclear policy, had the view that nuclear proliferation is good for maintaining international peace and stability. He believed that nuclear weapons are "paper tigers" in the sense that nuclear weapons could not be used because of their tremendous destructive power and the humanitarian consequences. Any country that used nuclear weapons would become politically isolated.⁵⁹⁷ From the military perspective, nuclear weapons only had a very limited role to play on the battlefield due to their highly indiscriminate destructive power and nuclear weapons would not be very useful against a "people's war."⁵⁹⁸ Zhou Enlai had the same view about nuclear weapons.⁵⁹⁹ In a 1961 statement, Zhou elaborated the same view with Mao: "If all countries have nuclear weapons, the possibility of nuclear wars would decrease."⁶⁰⁰

With this view of nuclear weapons, China's top leaders believed that nuclear weapons could only be used for coercive political purposes, and this was exactly what the nuclear

⁵⁹⁶Paul K Kerr, *2010 Non-Proliferation Treaty (Npt) Review Conference: Key Issues and Implications*(DIANE Publishing, 2011); *Pakistan's Nuclear Weapons: Proliferation and Security Issues*(DIANE Publishing, 2010); Mary Beth Nikitin, *Proliferation Security Initiative (Psi)*(DIANE Publishing, 2008).

⁵⁹⁷Zedong (毛泽东) Mao, *Selected Works of Mao Zedong on Foreign Relations (毛泽东外交文选)*(Beijing: Central Documentation Press (中央文献出版社), 1994).

⁵⁹⁸"The Situation after Winning the Anti-Japanese War and Our Policy (抗日战争胜利后的时局和我们的方针 (1945 年 8 月 13 日))," in *Selected Works of Mao Zedong, Volume 4 (毛泽东选集, 第 4 卷)*(Beijing: People's Publishing House (人民出版社), 1991).

⁵⁹⁹Enlai (周恩来) Zhou, "Launch a National-Wide Counterattack and Take Down Jiang Jieshi (全国大反攻打倒蒋介石)," in *Selected Works of Zhou Enlai, Volume One (周恩来选集 (上卷))*(Beijing: People's Publishing House (人民出版社), 1980).

⁶⁰⁰Enlai (周恩来) Zhou, *Selected Works of Zhou Enlai on Foreign Affairs (周恩来外交文选)*(Beijing: Central Archives Press (中央文献出版社), 1990).

superpowers did toward China—use nuclear blackmail to coerce and intimidate China.⁶⁰¹ Nuclear proliferation was therefore regarded as a way to counter the nuclear blackmail from the United States, Britain, and France and to force them ultimately give up their nuclear weapons and nuclear coercion policy.⁶⁰² In his meeting with Bernard Montgomery on September 24, 1961, Mao explicitly mentioned, “I am not interested in nuclear weapons. These things are not going to be used; the more they are made, the less likely that nuclear wars are going to take place. The wars ultimately have to be fought with conventional weapons.”⁶⁰³ Mao told Montgomery that China was developing nuclear weapons and stated, “When will we get the weapon? I don’t know. The United States has so many of them. They have ten fingers. Even if we ultimately get the weapon, we would only have one finger. This thing can only be used to intimidate people; it costs a lot of money, but it is not useful.” He went on to explain the Chinese motivation for developing nuclear weapons: “It is like the poor people, the beggars who put on a nice-looking dress and run around to let people see.”⁶⁰⁴

Mao’s thinking on nuclear weapons and nuclear proliferation greatly influenced China’s official nuclear policy. From the perspective of the Chinese government, the purpose of nuclear weapons development was to “break the nuclear power’s nuclear monopoly.” Therefore, China saw its development of nuclear weapons as support for the “oppressed

⁶⁰¹Zedong (毛泽东) Mao, *Selected Works of Mao Zedong: Volume Four* (毛泽东文集: 第四卷)(Beijing: Central Documentation Press (中央文献出版社), 1999).

⁶⁰²Jing (陈静) Chen, "An Analysis of China's Policy toward the International Nuclear Nonproliferation: Historical Evolution and the Future (分析中国对国际核不扩散机制的政策: 演变与未来)" (Beijing Language and Culture University (北京语言大学), 2008).

⁶⁰³Mao, *Selected Works of Mao Zedong on Foreign Relations* (毛泽东外交文选).

⁶⁰⁴Ibid.

people” in the world,⁶⁰⁵ and China was against the nuclear powers’ opposition to nuclear proliferation, believing that it was unfair to allow nuclear weapons states to retain and further develop nuclear weapons but not to allow nonnuclear weapons states to develop nuclear weapons.⁶⁰⁶ In China’s August 15, 1963, statement, the government claimed that when more than one country in the world obtained nuclear weapons, the danger was actually “smaller, rather than bigger,” because “whether nuclear weapons contribute to world peace depends on in whose hands they are.”⁶⁰⁷ It also stated that “the danger of nuclear war is bigger if nuclear monopoly by the American imperialists and their allies is maintained. As long as others who oppose them also have (nuclear weapons), they would not be that arrogant; their nuclear blackmail and nuclear threat policy would not be that effective; the chances for achieving comprehensive prohibition and complete elimination of nuclear weapons would be larger.”⁶⁰⁸ In another statement, China claimed, “The more countries develop their own nuclear weapons, the more possible it is to prohibit nuclear weapons, and the more possible it is to delay a world war.”⁶⁰⁹

In fact, China held such a high profile as an open opponent against the “unjust” international nonproliferation system, it did not care to hide its intentions to develop its own nuclear weapons to break the perceived nuclear monopoly. Over the several years

⁶⁰⁵ Zhu, "The Evolution of China's Nuclear Nonproliferation Policy."

⁶⁰⁶ Zhan (吴展) Wu, "Fifty Years of Nuclear Weapons (核武器的五十年)," in *War and Peace: Commemorating the Fiftieth Anniversary of the Victory of the Anti-Fascist War and the Establishment of the United Nations* (战争与和平: 纪念反法西斯战争胜利暨联合国成立五十周年), ed. Guocheng (胡国成) Hu and Mei (赵梅) Zhao (Beijing: China Social Sciences Press (中国社会科学出版社), 1996).

⁶⁰⁷ "Statement of the Spokesperson of the Government of the People's Republic of China: A Commentary on the August 3 Statement of the Soviet Union Government (中华人民共和国政府发言人声明——评苏联政府八月三日的声明)," *Gazette of the State Council of the People's Republic of China* (中华人民共和国国务院公报), no. 14 (1963).

⁶⁰⁸ "Statement of the Government of the People's Republic of China (中华人民共和国政府声明)."

⁶⁰⁹ "A Debate on the General Direction of the International Communist Movement (关于国际共产主义运动总路线的辩论)," (Beijing: People's Publishing House (人民出版社), 1965).

before China conducted its first nuclear explosion on October 16, 1964, Mao Zedong openly talked about China's development of nuclear weapons with visiting foreign statesmen. He not only admitted to Montgomery in 1961 that China was developing nuclear weapons but also mentioned China's goal of obtaining nuclear weapons with French, Japanese, and American visitors.⁶¹⁰ Mao's rather open and relaxed attitudes toward China's nuclear development program also reflected his belief that nuclear proliferation by China and other developing countries was a contribution to world peace and international stability.

China's opposition to the international nonproliferation regime that was dominated by the United States and Soviet Union was also a direct result of its opposition to the two nuclear superpowers.⁶¹¹ During the Cold War, all the direct and indirect security threats facing China were perceived as coming from the two superpowers. Under China's "anti-imperialism" and "anti-hegemonism" policy, the United States and Soviet Union were seen as China's primary enemies and sources of security concerns. China's strong ideological opposition to these two countries added to its resistance against the nonproliferation initiatives and regimes backed by the United States and Soviet Union. At the same time, China's self-identification with the developing countries contributed to its view that imperialism, hegemonism, and colonialism were the reasons of China's insecurity and the world's instability whereas an alliance with the socialist countries and "third-world" countries could defend their security through the construction of a "united front." With "standing with the developing countries" becoming the starting point of

⁶¹⁰Zedong (毛泽东) Mao, *Selected Works of Mao Zedong: Volume Eight* (毛泽东文集: 第八卷)(Beijing: Central Documentation Press (中央文献出版社), 1999).

⁶¹¹Chen, "An Analysis of China's Policy toward the International Nuclear Nonproliferation: Historical Evolution and the Future (分析中国对国际核不扩散机制的政策: 演变与未来)."

China's foreign policy, China saw the Nuclear Nonproliferation Treaty as a hegemonic treaty and refused to join, even though the treaty recognizes China's status as an official nuclear weapons state.⁶¹²

These traditional views dominated Chinese official thinking about nuclear proliferation for decades. Even in the 1980s and early 1990s, some of China's top leaders were still highly skeptical about nonproliferation policies of the West and viewed them as inherently discriminatory and as a means for the "superpowers" to contain China's development and to constrain China's foreign policy goals.⁶¹³ In general, the Chinese leadership's view was closer to that of the proliferation optimists in the United States than that of the proliferation pessimists. Proliferation optimists believed nuclear weapons constituted a credible deterrence against the use of nuclear weapons and that nuclear deterrence stabilizes interstate relations and prevents wars from breaking out.⁶¹⁴ However, the Chinese leaders were not completely proliferation optimists. Proliferation optimists believe the chances of nuclear wars ever breaking out are very low because "nuclear weapons are a superb deterrent."⁶¹⁵ By contrast, Chinese leadership believed nuclear wars were unlikely to take place because nuclear weapons were essentially "unusable"—something Western scholars later summarized as the "nuclear taboo."⁶¹⁶ They

⁶¹²Baogen (周宝根) Zhou and Bin (李彬) Li, "Non-Military Factors in Arms Control (军备控制中的非军事因素)," *International Economic Review (国际经济评论)* 5(2002).

⁶¹³Medeiros, *Chasing the Dragon: Assessing China's System of Export Controls for Wmd-Related Goods and Technologies*.

⁶¹⁴Posen, "The Security Dilemma and Ethnic Conflict."; Van Evera, "Primed for Peace: Europe after the Cold War."; Peter R Lavoy, "Civil-Military Relations, Strategic Conduct, and the Stability of Nuclear Deterrence in South Asia," *Center for International Security and Arms Control, Stanford University, Stanford, CA* (1994).

⁶¹⁵Mearsheimer, "Back to the Future: Instability in Europe after the Cold War."; "Case for a Ukrainian Nuclear Deterrent, The," *Foreign Aff.* 72(1992).

⁶¹⁶Liu and Liu, "Mao Zedong's Nuclear Ethical Thought and Its Epochal Value (论毛泽东核伦理思想及其时代价值)."; Nina Tannenwald, "The Nuclear Taboo: The United States and the Normative Basis of

emphasized that nuclear weapons in the hands of “peace-loving countries” would contribute to peace and stability. The stabilizing effect of nuclear proliferation came from the breakdown of nuclear monopoly by the superpowers.⁶¹⁷

Perception Change from the Bottom Up

The gradual change of Chinese perception toward nuclear nonproliferation took place largely from the bottom level. Since the 1980s, the United States has put a high priority on nuclear nonproliferation during operational-level engagement with China and extensive discussions on nuclear nonproliferation took place during these exchanges and dialogues. These engagement programs helped to change the perception of the Chinese nuclear community on nuclear nonproliferation in at least three ways.

First, operational-level engagement helped the Chinese nuclear community recognize the dangers of nuclear proliferation. Through U.S.-Chinese exchange programs and dialogues, many American experts became very well known to the Chinese nuclear community.

Frank Von Hippel and Richard Garwin are two examples. Frank Von Hippel is nuclear physicist and a former assistant director for national security in the White House Office of Science and Technology and a professor at Princeton University. Richard Garwin is also a physicist and has worked at IBM, Harvard University, and the Council on Foreign Relations. Both of them were very proactive in organizing and participating in nuclear dialogues and exchanges with China and had a very significant influence within the Chinese nuclear community. Their work was widely read and highly regarded and their

Nuclear Non-Use " *International Organization* 53, no. 3 (1999); "Stigmatizing the Bomb: Origins of the Nuclear Taboo," *International Security* 29, no. 4 (Spring 2005).

⁶¹⁷Zhang, "An Analysis of the Nuclear Strategic Thinking of Mao Zedong and Zhou Enlai (试论毛泽东、周恩来的核战略思想)."

research was closely followed and often cited by Chinese nuclear experts.⁶¹⁸ During dialogues and exchanges, Chinese experts learned from their American colleagues what the United States had experienced during nuclear crises with the Soviet Union including the Cuban Missile Crisis, Berlin Crises, and the Arab-Israeli wars. They also learned the dreadful accidents during the Cold War when false alarms nearly caused the United States and the Soviet Union to launch their nuclear weapons by mistake.⁶¹⁹ During such engagement, American arguments about the dangers of nuclear proliferation apparently had a big influence on their Chinese colleagues and prompted them to develop a more comprehensive understanding about nuclear nonproliferation.⁶²⁰

Many Chinese experts, although some still insisted that hegemonism was the ultimate source of war and international conflict, began to point to nuclear proliferation as another contributing factor to international instability. For example, ZouYunhua, a frequent participant of U.S.-Chinese nuclear dialogues, was one of the first Chinese experts who openly admitted the dangers of nuclear proliferation and advocated for measures against nuclear proliferation: "Some countries are trying to master the technology of producing nuclear explosive materials. Therefore, when we make efforts to resolve regional conflicts, we should also prevent nuclear proliferation from taking place."⁶²¹ Other Chinese experts also sounded alarm about dangers of nuclear proliferation: "Some countries that pursue regional hegemony or have hidden intentions are also making

⁶¹⁸Alastair Iain Johnston and Paul Evans, "China's Engagement with Multilateral Security Institutions," in *Engaging China: The Management of an Emerging Power*, ed. Robert S Ross and Alastair Iain Johnston (New York: Routledge, 2006).

⁶¹⁹ Such as the Able Archer 83 exercise in 1983 when the Soviets wrongly believed that the NATO was using the exercise as a disguise for a surprise attack.

⁶²⁰Medeiros, *Reluctant Restraint: The Evolution of China's Nonproliferation Policies and Practices, 1980-2004*.

⁶²¹Zou, "Non-Proliferation of Nuclear Weapons - an Observation on the Eve of the Fourth Npt Review Conference (不扩散核武器——写在《不扩散核武器条约》缔约国第四次审议会议之前)."

efforts to obtain nuclear weapons, in order to achieve their illegitimate objectives...

Nuclear nonproliferation has to be the guiding principle of international cooperation over the peaceful use of nuclear energy.”⁶²²

This perception change of the Chinese expert community seemed to have affected the Chinese government’s attitudes toward NPT. After an open discussion by Chinese experts in favor of partially embracing the principle of nuclear nonproliferation, in August 1990, a Chinese delegation attended the Fourth NPT Review Conference as observers. It submitted a “Document on Basic Positions” to the conference and admitted for the first time that “the NPT has played a certain positive role in the prevention of nuclear proliferation and the maintenance of world peace and stability.”⁶²³

Second, operational-level engagement helped the Chinese nuclear community start to reassess and redefine its national interests. The Chinese nuclear community was the first to realize in the 1980s that readjusting China’s nuclear nonproliferation policy would be economically beneficial for China. Through engagement programs such as those between the DOE and CIAE, Chinese nuclear experts came to the understanding that U.S. nuclear energy technology would be very helpful for the development of China’s own civilian nuclear energy programs and China needed to get access to the U.S. nuclear energy market. Because of the high priority that the United States had attached to the issue of nuclear nonproliferation, China would benefit greatly from aligning its nuclear

⁶²²Zhiyong (于智勇) Yu, "Rethinking Some of the Issues Related to the Nuclear Nonproliferation Treaty (关于《核不扩散条约》若干问题的再认识)," *World Economics and Politics* (世界经济与政治), no. 06 (1988).

⁶²³"Must Comprehensively Prohibit and Completely Eliminate Nuclear Weapons (必须全面禁止和彻底销毁核武器)," *The People's Daily* (人民日报), September 13 1990.

nonproliferation policy with that of the United States in order to remove the obstacles between U.S.-Chinese civilian nuclear energy cooperation.⁶²⁴

Chinese experts also noted the security benefits that nuclear nonproliferation had brought China.⁶²⁵ For instance, Taiwan's nuclear proliferation efforts were terminated as a result of the U.S. nonproliferation measures. Taiwan had started its nuclear weapons program in the 1960s, but because of the safeguard measures taken by the United States and the International Atomic Energy Agency, its program was not going very well. In the 1970s, the United States intervened repeatedly to disrupt Taiwan's suspicious nuclear research.⁶²⁶ In 1988, the United States visited the Institute for Nuclear Energy Research (INER) and forced Taiwan to dismantle the hot cell facility and shut down the Taiwan Research Reactor. This essentially terminated Taiwan's secret nuclear weapons program.⁶²⁷ Chinese experts also recognized the role of the international nonproliferation regime in preventing the nuclearization of the Korean Peninsula and in delaying the Iraqi nuclear weapons program in the early 1990s.⁶²⁸ Unlike China's top leadership, the

⁶²⁴Jianwei (刘建伟) Liu, "China's Nuclear Nonproliferation Policy and Behavioral Change: A Normative and Legal Perspective (中国核不扩散政策和行为变化——一种规范合法性的解读)," *Contemporary Asia-Pacific Studies* (当代亚太), no. 4 (2011).

⁶²⁵Personal correspondence with Chinese experts and former Chinese diplomats, 2009.

⁶²⁶Chongyan (张崇岩) Zhang, "Israel, South Africa, and Taiwan Are Possibly Collaborating on Nuclear Weapons Development (以色列、南非、台湾可能在共同研究核武器)," *Global Nuclear News* (国外核新闻), no. 10 (1981); Sheng (苗生) Miao, "The inside Story of Taiwan's Nuclear Weapons Development (台湾研制核武器内幕)," *Technology Tide* (科技潮), no. 06 (1996).

⁶²⁷Shixin (焦世新) Jiao, "A Balance of Interests: The Role of the United States in China's Participation in International Institutions (利益的权衡: 美国在中国加入国际机制中的作用)" (Fudan University (复旦大学), 2007).

⁶²⁸Yuan (吕原) Lv, "Iraq Pursues Nuclear Weapons (伊拉克谋求核武器)," *Global Nuclear News* (国外核新闻), no. 05 (1990); Liang (微亮) Wei, "The U.N. Inspection Team States That Iraq Could Restart Its Nuclear Weapons Program at Any Time (联合国检查组说伊拉克随时可能重建其核武器计划)," *Global Nuclear News* (国外核新闻), no. 12 (1991); Ji (家骥) Jia and Hua (邵华) Shao, "Iraq's Secret Nuclear Weapons Program (伊拉克的秘密核武器计划)," *World Science and Technology Research and Development* (世界科技研究与发展) 6(1992); Jinzhou (郭金周) Guo, "The United States Government Suspects North Korea Was Going to Develop Nuclear Weapons (美国政府猜测朝鲜要发展核武器)," *Global Nuclear News* (国外

Chinese nuclear community was much more sensitive to the new trend of proliferation in regions close to China and across the world and was more appreciative of the importance of the international nonproliferation system in containing the emergence of new proliferating countries. They argued that there was little cost for China to join the international nonproliferation regime because China's nuclear status was already recognized by the regime and that it was in China's interests to prevent further proliferation of nuclear weapons.⁶²⁹

Third, operational-level engagement helped the Chinese nuclear community to advocate for a more pragmatic nuclear policy. For a very long time, China's nuclear policy was very much principle-oriented: China did not develop sophisticated positions or policy proposals on specific nuclear issues except a very limited number of nuclear principles that were adopted by Mao, Deng, and other Chinese top leaders. Some of the most well known principles include the No First Use policy, the negative security assurance, and the "support for comprehensive prohibition and complete elimination of nuclear weapons."⁶³⁰ China saw the ultimate solution for eliminating the risk of nuclear wars was for everyone to completely eliminate nuclear weapons.⁶³¹ Any policy discussions that fell short of seeking to achieve the end goal of "the comprehensive prohibition and complete

核新闻), no. 02 (1990); Yujie (程玉洁) Cheng, "The Nuclear Issue on the Korean Peninsula (朝鲜半岛的核问题)," *Contemporary International Relations (现代国际关系)* 9(1993).

⁶²⁹Yu, "Rethinking Some of the Issues Related to the Nuclear Nonproliferation Treaty (关于《核不扩散条约》若干问题的再认识)."; Zou, "Non-Proliferation of Nuclear Weapons - an Observation on the Eve of the Fourth Npt Review Conference (不扩散核武器——写在《不扩散核武器条约》缔约国第四次审议会议之前)."; Jinkun (石锦坤) Shi, "This Year's Disarmament Conference in Geneva Brings New Hope (今年日内瓦裁军会议带来新的希望)," *World Affairs (世界知识)*, no. 24 (1986).

⁶³⁰"Statement of the Government of the People's Republic of China on Comprehensively, Completely, Unambiguously, and Resolutely Prohibiting and Eliminating Nuclear Weapons and Calling for the Convening of an International Summit (中国政府主张全面、彻底、干净、坚决地禁止和销毁核武器、倡议召开世界各国政府首脑会议的声明)," *ibid.*, no. 15 (July 13 1963).

⁶³¹Longbo (冉隆勃) Ran, "Current Peace Movement in the World (当前的世界和平运动)," *ibid.* 14(1985).

elimination of nuclear weapons” were not paid much attention by China. This was especially true for the issue of nuclear nonproliferation. China saw nuclear nonproliferation as only contributing to the nuclear monopoly of very few countries but was not helpful for bringing about complete nuclear disarmament. Nuclear nonproliferation could not be pursued as a goal in itself.⁶³²

Such a view had effectively prevented China from participating in international nuclear nonproliferation discussions and was first challenged by experts from the Chinese nuclear community. During the 1980s, voices in the Chinese nuclear community stated that China’s attitudes toward nuclear nonproliferation were too rigid and argued for a rethinking of China’s existing policy. They pointed out that China’s nuclear policy was “constrained by a limited number of fundamental principles, and lacks initiative and flexibility.”⁶³³

More importantly, nuclear experts such as Liu Huaqiu pointed out that nuclear nonproliferation was “a step toward the comprehensive prohibition and complete elimination of nuclear weapons” and therefore was worth pursuing.⁶³⁴ He argued against the simplistic policy of only focusing on the end goal and losing sight of the importance of taking intermediate steps that could directly or indirectly contribute to the end goal. These voices pressed the government to take a more pragmatic approach in making its nuclear policy. By the early 1990s, the Chinese government had embraced a more

⁶³²Jin (田进) Tian, *China in the United Nations (中国在联合国)*(Beijing: World Knowledge Publishing House (世界知识出版社), 1999); Zhu, "The Evolution of China's Nuclear Nonproliferation Policy."

⁶³³Shuzhong (王书中) Wang, "Disarmament Struggle and a Few Perceptual Issues (裁军斗争与几个认识问题)," in *International Disarmament Struggle and China: A Collection of Research Papers (国际裁军斗争与中国: 论文集)*(China Institutes of Contemporary International Relations (现代国际关系研究所): Current Affairs Press (时事出版社), 1987).

⁶³⁴Liu, "Analysis of China's Nuclear Arms Control Policy (中国核军控政策评析)."

practical attitude toward nonproliferation. It began to acknowledge the positive effect of nuclear nonproliferation efforts and no longer denied the value of the basic ideas behind the international nonproliferation regime.⁶³⁵ It continued to express dissatisfaction about some of the institutional design of the regime, which it thought, was unfair, but it began to seriously consider nuclear nonproliferation as a worthy goal to pursue in itself.⁶³⁶

NPT Membership and the Top Leadership's Endorsement

Following the advocates from the nuclear community, China began to gradually embrace nuclear nonproliferation as a government policy. Compared to its previous general opposition against nonproliferation, the government shifted toward a less confrontational position in the 1980s and began to limit the subject of its opposition to a selected few. China "emphatically opposed to any production of nuclear weapons by racists and expansionists such as South Africa and Israel."⁶³⁷

The selective opposition to proliferation subsequently changed into a general opposition against all nuclear proliferation. In a 1991 meeting with the International Atomic Energy Agency director general Hans Blix, Premier Li Peng stated, "China's position is clear-cut, that is, China won't practice nuclear proliferation. Meanwhile, we are against the proliferation of nuclear weapons by any other country."⁶³⁸ In the same year, the vice

⁶³⁵Jieyi (刘结一) Liu, "Speech of Director General Liu Jieyi at the Dinner of the International Arms Control Annual Convention of the U.S. Sandia National Laboratory (刘结一司长在美国桑迪亚国家实验室国际军控年会晚宴上的讲话)," (Ministry of Foreign Affairs, 2002).

⁶³⁶Yan Zhang, "Looking Beyond the 2005 Npt Review Conference, Statement by H.E. Ambassador Zhang Yan, Director-General, Department of Arms Control and Disarmament, Ministry of Foreign Affairs of China," (UN Regional Center for Peace and Disarmament in Asia and the Pacific, December 1 2005).

⁶³⁷Xinhua, "Vice Premier Deng Xiaoping to Indian Journalists, Chinese Statements on Proliferation Issues: 1979-1991," *FBIS-SM-91-10007*.

⁶³⁸"Premier Li Peng in a Meeting with Director General Hans Blix of the Iaea, Chinese Statements on Proliferation Issues: 1979-1991," *FBIS-SM-91-10007*.

foreign minister Liu Huaqiu admitted that the Nuclear Nonproliferation Treaty was a universal international agreement and had played an important role in preventing nuclear proliferation. He reaffirmed that the treaty “had a positive impact.”⁶³⁹ Regarding its own engagement in nuclear proliferation, starting from the late 1980s, China began to openly embrace the policy of renouncing the “encouragement of nuclear proliferation” by China. China’s foreign minister Wu Xueqian stated, “We don’t stand for, encourage, or engage in nuclear proliferation.”⁶⁴⁰ This “three nots” policy indicated China’s first open commitment to not contributing to nuclear proliferation by itself. This gradual change of policy finally led to the signing of the Nuclear Nonproliferation Treaty in 1992. During this process, China’s nuclear community, particularly the nuclear defense industry (IAPCM, CAEP, and COSTIND), which had been a major participant in U.S.-Chinese nuclear exchanges, played an important role in supporting China’s membership in the NPT.⁶⁴¹ The Chinese government’s stated reasons for its embracement of the NPT were exactly along the same line of argument made by the nuclear defense industry and the civilian energy industry. The Government Work Report of the State Council released at the First Plenary Meeting of the Seventh National People’s Congress acknowledged that nuclear nonproliferation has certain positive effect because nuclear proliferation does not fully fall in line with China’s national interests.⁶⁴² Chinese senior diplomats also

⁶³⁹Jun (王君) Wang, "The Change of China's Nonproliferation Policy after the Cold War and Its Causes (冷战后中国不扩散政策的转变及其原因分析)," *Pacific Journal (太平洋学报)*, no. 4 (2002).

⁶⁴⁰*International Situation Yearbook: 1985 (国际形势年鉴 1985)*, (Shanghai: Shanghai Institute of International Studies (上海国际问题研究所), Shanghai Branch of Chinese Encyclopedia Press (中国大百科全书出版社上海分社), 1988).

⁶⁴¹Zhang, *China's Changing Nuclear Posture: Reactions to the South Asian Nuclear Tests*; Johnston and Evans, "China's Engagement with Multilateral Security Institutions."

⁶⁴²Peng (李鹏) Li, "Government Work Report of the State Council (国务院政府工作报告)," (Beijing: First Plenary Meeting of the Seventh National People's Congress (第七届全国人民代表大会第一次会议上), March 25 1988).

expressed the view that “a strong international nuclear nonproliferation regime” serves their national interests. They warned against the potential consequences of nuclear proliferation, which “might ultimately hurt one’s own national interests.”⁶⁴³

The signing of the NPT, however, did not mean that all the ideas and concepts of nuclear nonproliferation as embodied in the NPT had been completely accepted by the Chinese top leadership. It took another few years for China to officially show strong support for NPT. In China’s 1995 White Paper on Arms Control and Disarmament, China still expressed a number of reservations regarding the existing nonproliferation regime. It emphasized the view that nonproliferation is not a goal in itself and held a very critical view against the “double standard” and those nonproliferation actions that undermined the rights of developing countries on peaceful nuclear energy.⁶⁴⁴ By the late 1990s, China’s defense white papers began to express much stronger support for the NPT regime. The 1998 Defense White Paper, for example, claims, “China vigorously supports and participates in the international nonnuclear proliferation efforts.” It expresses a pressing need for “the international community to strengthen non-proliferation mechanisms” and expresses support for the IAEA’s Program for Strengthening the Effectiveness and Promoting the Efficiency of the Safeguard System (93 + 2 program). It also pledges to negotiate and conclude with the IAEA a legally binding document and to adopt measures corresponding to the obligations of the first article of the NPT.⁶⁴⁵ This indicates that senior officials, especially officials from the military and the foreign ministry, reached a

⁶⁴³“Collection of Speeches Delivered by the Chinese Delegation to the United Nations (中国代表团出席联合国有关会议发言汇编),” (United Nations Association of China (中国联合国协会), World Knowledge Publishing House (世界知识出版社), 1999).

⁶⁴⁴“China’s Arms Control and Disarmament (中国的军备控制与裁军).”

⁶⁴⁵“China’s National Security White Paper: 1998 (1998 年中国的国防),” (Beijing: State Council Information Office (国务院新闻办公室), 1998).

general consensus that “it serves China’s national interests to participate in the international nonproliferation regime” and that they were willing to see China play an active role in IAEA and other nonproliferation institutions.⁶⁴⁶

Chinese top leaders’ first direct and explicit endorsement of nuclear nonproliferation came in 1999. On March 26, 1999, President Jiang Zemin delivered a speech at the Conference on Disarmament in Geneva. For the first time, he mentioned that “[t]he Nuclear Nonproliferation Treaty is the foundation of the international nuclear nonproliferation system, and the precondition for achieving progress on nuclear disarmament. This treaty must be thoroughly and comprehensively implemented; otherwise international efforts for nuclear disarmament and nonproliferation will be severely undermined. Countries that have not joined the Nuclear Nonproliferation Treaty should join as soon as possible, in order for the treaty to be truly universal.” Jiang also departed from the traditional emphasis on nuclear disarmament over nonproliferation and pointed out that “for present and for the long-term future, preventing nuclear proliferation and promoting nuclear disarmament are going to be important tasks facing the international community.” For the first time, he argued that “nuclear nonproliferation and comprehensive and complete nuclear disarmament—these two things are complementary to each other. Comprehensive and complete nuclear disarmament is the goal that we

⁶⁴⁶Wenhui (王文辉) Wang, "Analysis of China's Participation in International Nuclear Nonproliferation Regime (中国参与国际核不扩散机制分析)" (Chinese University of Foreign Affairs (外交学院), 2011).

strive for; nuclear nonproliferation is an effective means and a necessary step to achieve this goal.”⁶⁴⁷

Strategic Trust

Operational-level engagement played an important role in helping the United States and China find common interests. Bilateral dialogues and exchanges helped change China's traditional opposition against nonproliferation by introducing to the Chinese nuclear community the dangers of nuclear proliferation and convincing them about the negative impact that proliferation would have on China's national security. These exchanges prompted the Chinese nuclear community to reassess its national security interests, which resulted in a departure from China's simplistic understanding about nonproliferation and motivated the Chinese nuclear community to advocate for a more pragmatic approach toward nuclear nonproliferation issues. The Chinese nuclear community challenged the view that “nuclear weapons in the hands of peace-loving countries” would always contribute to stability.⁶⁴⁸ It recognized that nuclear nonproliferation efforts by the United States and other countries benefited China's national interests and pointed out that China's interests would be undermined if further proliferation took place.⁶⁴⁹ Operational-level engagement with China's nuclear community also convinced them about the potential economic and technology benefits that China could receive if it responded more

⁶⁴⁷Zemin (江泽民) Jiang, "Promoting Disarmament and Maintaining International Peace: A Speech at the Conference on Disarmament in Geneva (推动裁军进程, 维护国际安全——在日内瓦裁军谈判会议上的讲话)," *The People's Daily* 1999.

⁶⁴⁸Xia, "An Preliminary Analysis on Contemporary Nuclear Proliferation in the Asian-Pacific Region (浅析当前亚太地区的核扩散)."

⁶⁴⁹Guo, "International Institution Integration and National Interests: A Historical Analysis of China's Foreign Policy (国际制度的融入与国家利益——中国外交的一种历史分析)."; Pan, Xia, and Wang, *International Disarmament and Arms Control* (国际裁军与军备控制).

positively to the U.S. nonproliferation requirements. This gradual change of perception at the operational level apparently influenced China's official policy and the thinking of top leadership. The Chinese government began to admit the importance of nuclear nonproliferation to the security of China and the international community. It also increasingly expressed the common goals and interests that China and the United States share in nuclear nonproliferation.⁶⁵⁰ As some senior Chinese officials noted, the United States and China share "vast common interests" and "we do feel that in bilateral relations nonproliferation should be a positive aspect."⁶⁵¹ They believed that, after September 11, the international security environment is even more uncertain and unpredictable. In such a situation, the United States and China possess even greater incentives to maintain common security through nonproliferation cooperation.⁶⁵²

China's nonproliferation policy toward the North Korea is another case in which Chinese strategic trust toward the United States increases as a result of recognizing more common interests. Facing increasing tensions on the Korean Peninsula, the Chinese top leadership was more inclined to "stabilize the situation" through small and precautionary steps that did not challenge either the United States or North Korean positions. Such steps included calling for both North and South Korea to increase communication and dialogue, emphasizing the importance of the United States having a "constructive and equal"

⁶⁵⁰Song Li, "Statement by Mr. Li Song Deputy Director-General of the Department of Arms Control and Disarmament, Ministry of Foreign Affairs, China," (Warsaw: Annual NATO Conference on Arms Control, Disarmament and Nonproliferation, December 10, 2009); Yan Zhang, "Statement by H.E. Amb. Zhang Yan Director-General of the Department of Arms Control and Disarmament of the Ministry of Foreign Affairs of the People's Republic of China at the Thematic Debate of the First Committee of the 60th Session of the United Nations General Assembly on Nuclear Disarmament and Non-Proliferation," (New York: Permanent Mission of the People's Republic of China to the United Nations Office at Geneva and Other International Organizations in Switzerland, October 10 2005).

⁶⁵¹Medeiros and Saunders, "Fourth U.S.-China Conference on Arms Control, Disarmament and Nonproliferation: "Building a Global Strategic Framework for the 21st Century.""

⁶⁵²Ibid.

dialogue directly with the North Korea, and working toward maintaining a multilateral consultation framework to reduce tensions.⁶⁵³ The Chinese nuclear community, on the other hand, was more alarmed and concerned about potential security threats posed by North Korean nuclear tests and possession of nuclear weapons capability to China's interests. They emphasized that "the continuous escalation of the Korean nuclear crisis is bringing about serious negative impact on the Peninsula... the possibility of misfiring or military conflict breaking out between North Korea and the United States, Japan, and South Korea is quickly increasing... In the mid- to long-term, if North Korea becomes a *de facto* nuclear state, the military confrontation between North Korea and the United States, Japan, and South Korea would be far more serious; the Peninsula would be much farther away from peace and stability."⁶⁵⁴ They even claimed, "China is the immediate victim of North Korea's nuclear test[s], which put[s] Chinese citizens at risk given the test location's proximity to the border; North Korea ignores Chinese national interests and complains about China despite receiving its aid, thus becoming a strategic and economic liability for Beijing."⁶⁵⁵ Therefore, they called for more forceful and proactive measures from China. Zhang Liangui, China's prominent Korean expert, argued, "China should use its influence to change North Korea's policy."⁶⁵⁶ Xu Jin, an expert from the Chinese Academy of Social Sciences, claimed, "[I]t is necessary for China's North Korea

⁶⁵³Jiaxuan (唐家璇) Tang and Igor Ivanov, "Joint Press Release of the Ministers of Foreign Affairs of the People's Republic of China and the Russian Federation on the Situation on the Korean Peninsula (中华人民共和国与俄罗斯联邦外交部长关于朝鲜半岛局势的联合新闻公报)," (Ministry of Foreign Affairs, February 27 2003).

⁶⁵⁴Tuosheng (张沅生) Zhang, "North Korean Nuclear Issue and China's Policy (朝核问题与中国的政策)," *International Security Studies (国际安全研究)*, no. 5 (2013).

⁶⁵⁵Quanmin (赵全敏) Zhao, "U.S. Presses China to Lead Sanctions against North Korea. Chinese Expert Says China Should Use Its Influence (美压中国挑头制裁朝鲜专家称中国应动用影响力)," *World News (世界新闻报)* June 26 2009.

⁶⁵⁶"Shades of Red: China's Debate over North Korea," (International Crisis Group, November 2 2009).

policy to be somewhat adjusted. (China) needs to transit[ion] from a neutral and indifferent mediator to a non-neutral and forceful intervener.”⁶⁵⁷ Many of them shared the view that China’s interests were aligned with those of the United States and other countries instead of those of North Korea and wanted China to work with “the other four parties in order to exert influence over North Korea.”⁶⁵⁸ This instigated an unprecedented domestic debate on this very sensitive issue—China’s North Korea policy. These debates were prominently featured in policy journals such as *China and World Affairs* (《中国与世界观察》), which published a special issue on this debate in 2009.⁶⁵⁹ After this domestic debate, Chinese officials became more open to talking about “common interests” between the United States and China on nuclear nonproliferation on the Korean Peninsula.⁶⁶⁰

Moreover, bilateral engagement not only helped to recognize common interests but also helped China build the technical capacity to actually achieve such common interests. During engagement, the U.S. experts came to the conclusion that China’s lack of technical capacity had significantly undermined its capability to effectively set up and implement export control systems.⁶⁶¹ As a result, training programs became a significant

⁶⁵⁷ Jin (徐进) Xu, "North Korean Nuclear Issue: Should China Forcefully Intervene or Take a Neutral Stand of a Mediator (朝鲜核问题: 中国应强力介入还是中立斡旋?)," *International Economic Review* (国际经济评论) 6(2011).

⁶⁵⁸ "Shades of Red: China's Debate over North Korea."

⁶⁵⁹ "China and International Affairs (中国与世界观察)," (Issue 2, 2009).

⁶⁶⁰ Zhang, "Statement by H.E. Amb. Zhang Yan Director-General of the Department of Arms Control and Disarmament of the Ministry of Foreign Affairs of the People's Republic of China at the Thematic Debate of the First Committee of the 60th Session of the United Nations General Assembly on Nuclear Disarmament and Non-Proliferation."; Medeiros and Saunders, "Fourth U.S.-China Conference on Arms Control, Disarmament and Nonproliferation: "Building a Global Strategic Framework for the 21st Century.""

⁶⁶¹ Medeiros, *Reluctant Restraint: The Evolution of China's Nonproliferation Policies and Practices, 1980-2004*; Yuan, "The Evolution of China's Nonproliferation Policy since the 1990s: Progress, Problems, and

component of U.S.-Chinese nuclear exchanges. A number of U.S. national laboratories, research institutes, and educational organizations initiated and organized various training and exchange programs that were targeted at growing Chinese nonproliferation specialists in a wide range of government agencies, nongovernmental organizations, the nuclear defense establishment, research institutes, and universities. They also reached out to the nuclear industry and conducted in-depth interaction with major companies and enterprises through joint training and co-development of export control tools and mechanisms.

In addition, operational-level engagement helped China to transition from a system of administrative control to a system of legally based control. Bilateral dialogues helped the Chinese nuclear community to recognize the inherent problems with their traditional emphasis on administrative control of nuclear and dual-use exports. With the help of American experts, China learned and gradually introduced the control lists from international nonproliferation regimes such as the Nuclear Suppliers Group and built its own legally based nuclear and dual-use export control system. Table 16 summarizes the laws and regulations established by China on nuclear-related or dual-use export controls.

Prospects."; Medeiros, *Chasing the Dragon: Assessing China's System of Export Controls for Wmd-Related Goods and Technologies*.

Table 16 Laws and Regulations Established by China on Nuclear Related or Dual-Use Export Controls

Laws and Regulations	Year
Foreign Trade Law	1994
Regulations on Nuclear Export Control of PRC	September 1997
Regulations on Export Control of Dual-Use Nuclear Goods and Related Technologies of PRC	June 1998; Revised in January 2008
The Procedures for the Management of Restricted Technology Export	November 1998
Regulations on Nuclear Export Control of PRC	2001 Revision
Provisional Measures on the Administration of the Export License on Sensitive Items and Technologies	January 2004
Regulations on Export Control of Dual-Use Nuclear Goods and Related Technologies of PRC	2008 Revision

Moralistic Trust

Chinese Understanding of U.S. Norm Compliance

Despite numerous dialogues and exchanges, the Chinese nuclear community's understanding of U.S. compliance with international nuclear nonproliferation norms is still very cynical and negative. The majority of China's nuclear community still believes that the United States uses nonproliferation to achieve its own "absolute security" and to

maintain “military superiority.”⁶⁶² There are exceptions, however. For instance, Yao Yunzhu, a frequent participant in U.S.-Chinese nuclear dialogues and a major general in the Academy of Military Science, actually believes that under the Obama administration, the United States has begun to change from seeking “absolute security” to “cooperative security” (合作安全).⁶⁶³ She notes that the Obama administration has departed from the Bush administration’s strategy of “preemption” and “full-spectrum dominance” and has proposed a new foreign policy direction that emphasizes the role of “smart power,” international coordination, and great power cooperation in addressing the threat of nuclear weapons.⁶⁶⁴ Such a voice, however, is very rarely heard. Looking at the overall thinking within the Chinese nuclear community, the absolute majority still holds the traditional view.⁶⁶⁵ This view is largely derived from the interpretations of two types of U.S. nonproliferation behaviors.

Firstly, the Chinese nuclear community is generally skeptical that international norms on nuclear nonproliferation are a guiding principle for U.S. policy-making. From their

⁶⁶² See, for example, Medeiros, "3rd Us-China Conference on Arms Control, Disarmament and Nonproliferation, Us-China Arms Control and Nonproliferation Cooperation: Progress and Prospects."; Cossa, Glosserman, and Santoro, "Progress Continues, but Disagreements Remain: The Seventh China-US Strategic Dialogue on Strategic Nuclear Dynamics & the Inaugural China-US Dialogue on Space Security."; Medeiros and Saunders, "Fourth U.S.-China Conference on Arms Control, Disarmament and Nonproliferation: "Building a Global Strategic Framework for the 21st Century." "; Liu, "An Analysis of the Nonproliferation Policy Shift under the Obama Administration (试析奥巴马政府防扩散政策的调整)."; Lu, "U.S.-China Arms Control Interaction and Its Theoretical Analysis (中美在军控领域的交流及其理论分析)."; Jing (卢静) Lu, "The Characteristics and Trend of Major Power Security Relations after the Cold War (冷战后大国安全关系的特征与走向)," *Teaching and Research (教学与研究)* 4(2012).

⁶⁶³ Guang (孔光) Kong and Yunzhu (姚云竹) Yao, "An Analysis of the "Nuclear Free World" Movement (“无核武器世界” 运动评析)," *World Economics and Politics (世界经济与政治)*, no. 9 (2009).

⁶⁶⁴ Ibid.

⁶⁶⁵ Wang, "On the United States' Political Theology of "Absolute Security" and Obam's "Nuclear-Free World" (论美国 “绝对安全” 神学政治与奥巴马 “无核世界思想”)."; Jiang and Cheng, "Analyzing the Obama Administration's Nuclear Deterrence Policy (析奥巴马政府的核威慑政策)."; Liu, "An Analysis of the Nonproliferation Policy Shift under the Obama Administration (试析奥巴马政府防扩散政策的调整)."

perspective, the U.S. nonproliferation policy does not focus on “what” the proliferant country does but “who” the proliferant country is.⁶⁶⁶

The Chinese nuclear community has been highly critical of the consistent U.S. “double standard” toward its allies and friends. The U.S. tolerance of Israeli nuclear weapons capability is seen as the fundamental source of the proliferation dynamics in the Middle East.⁶⁶⁷ The United States raises little question about the virtual nuclear capability of Japan but adopts extremely tough measures against the same capability pursued by Iran.⁶⁶⁸ The U.S. attitudes toward Japan’s military nuclear potential have particularly alerted the Chinese nuclear community’s concern that the United States explicitly pursues a “double standard” nuclear nonproliferation policy since Japan possesses all sensitive nuclear-related capabilities: uranium enrichment, plutonium reprocessing, and weapon delivery technology.⁶⁶⁹ The little attention that the United States pays to the nuclear potential of countries like Brazil and Germany contributes to this perception.⁶⁷⁰

⁶⁶⁶Nan (陈楠) Chen, "Counterproliferation Versus Nonproliferation: Current Debates in International Nuclear Nonproliferation (反扩散与不扩散: 当前国际防止核武器扩散中的争论)" (Fudan University (复旦大学), 2008).

⁶⁶⁷Xiancai (陈先才) Chen, "The International Nuclear Proliferation Crisis: Status Quo, Root Causes, and Countermeasures (全球核扩散危机: 现状, 根源及对策)," *Journal of Shanxi Normal University: Social Science Edition* (山西师大学报: 社会科学版) 33, no. 4 (2006); Ping (臧平) Zang and Jike (赵继珂) Zhao, "A Preliminary Analysis of the Kennedy Administration's Policy toward the Israeli Development of Nuclear Weapons (肯尼迪政府对以色列开发核武器的政策初探)," *Journal of Northeast Normal University: Philosophy and Social Sciences* (东北师大学报: 哲学社会科学版), no. 5 (2011).

⁶⁶⁸Chunling (李春玲) Li, "International Nuclear Nonproliferation Regime and the Issue of Japan's "Nuclear Militarization (国际核不扩散机制与日本的“核武装”问题)," *World Economics and Politics Forum* (世界经济与政治论坛), no. 4 (2005).

⁶⁶⁹Wansheng (徐万胜) Xu and Zhengnan (付征南) Fu, "The Tendency of Japan's Nuclear Policy (日本核政策动向)," *Contemporary International Relations* (现代国际关系) 4(2008); Kesheng (吴克生) Wu and Desheng (文德盛) Wen, "The Direction of Japan's Nuclear Weapons Policy (日本核武器政策取向)," *Contemporary World* (当代世界), no. 7 (2004).

⁶⁷⁰Mengjun (张孟军) Zhang, "The Double Standard of Nuclear Big Powers: Increasing the Danger of Nuclear Proliferation (核武器大国的双重标准: 将使核扩散的危险日益增加)," *Science and Technology Daily* (科技日报), August 1 2005.

The U.S. handling of its nuclear energy cooperation with India convinced the Chinese that the United States is willing to change rules of nonproliferation when doing so serves its geostrategic interests. The United States imposed sanctions on India after its 1998 nuclear tests, but these sanctions were lifted later. In less than two years after the tests, President Clinton visited India, and the U.S.-Indian relationship continued to improve very quickly during the Bush administration, which promised “to help India become a major world power in the 21st century.”⁶⁷¹ This dramatic change of policy was interpreted by the Chinese nuclear community as driven by a U.S. geostrategic calculation to work with India for the purpose of balancing against a rising China.⁶⁷² In 2006, President Bush signed the 123 Agreement between the United States and India into law as the U.S.-India Nuclear Cooperation Approval and Non-proliferation Enhancement Act, under which India was going to receive civilian nuclear technology and nuclear fuel from the United States. This U.S.-India agreement was unprecedented in the sense that the two sides made it possible by making changes to a number of existing laws and agreements including amending the U.S. Atomic Energy Act of 1954, creating a civil-military nuclear separation plan in India, an India-IAEA safeguards agreement, and making exemption for India by the Nuclear Suppliers Group—a nuclear export control group that had been formed mainly in response to India’s 1974 “peaceful nuclear explosion.” This deal also made it possible for India to keep and reprocess the spent

⁶⁷¹Brahma Chellany, "India Can Be America's Best Friend," *International Herald Tribune* 1(2005).

⁶⁷²Shuiming (时水明) Shi, "The Dilemma Facing the International Nuclear Nonproliferation Regime and Korean Nuclear Issue (国际核不扩散体制的困境与朝核问题)," *Peace and Development (和平与发展)* 3(2010); Li (张力) Zhang, "Understanding Indian-U.S. Strategic Relationship from the "Nuclear Agreement" (从“核协议”解读印美战略关系)," *South Asian Studies Quarterly (南亚研究季刊)*, no. 3 (2006).

nuclear fuel from U.S.-originated nuclear fuel. Chinese nuclear experts saw this as an implicit acknowledgement of India's de facto status as a nuclear weapons state.⁶⁷³

One of the most recent U.S. policies that further reinforced Chinese perceptions about the U.S. nonproliferation "double standard" is the United States signing a nuclear cooperation agreement with Vietnam without a legally binding commitment by Vietnam to renounce uranium enrichment and plutonium reprocessing.⁶⁷⁴ This agreement was signed by both countries in May 2014 and does not have the same gold standard that was in 123 Agreements with United Arab Emirates and Taiwan. As the agreement was initiated in 2010, the Vietnamese-Chinese relationship was turning bad because of their maritime territorial dispute in the South China Sea. By the time the treaty was signed, their relationship had become so bad that people were worrying about a possible military conflict between the two.⁶⁷⁵ This agreement was widely seen by the Chinese nuclear community as one more bit of evidence of U.S. employment of nonproliferation double standard driven by a geostrategic motivation to contain China's influence in the region.⁶⁷⁶

In general, the consensus view is that preserving and strengthening the international nuclear nonproliferation norm is not the top priority of the United States. The United

⁶⁷³Chunmei (康春梅) Kang, "The Impact of the U.S.-Indian Nuclear Agreement on India's Nuclear Capability (美印核协议对印度核能力的影响)," *China Academy of Engineering Physics Science and Technology Annual Report (中国工程物理研究院科技年报)*, no. 1 (2008); Shi, "The Dilemma Facing the International Nuclear Nonproliferation Regime and Korean Nuclear Issue (国际核不扩散体制的困境与朝核问题)."

⁶⁷⁴Mary Beth D. Nikitin, Mark Holt, and Mark E. Manyin, "U.S.-Vietnam Nuclear Cooperation Agreement: Issues for Congress," (Washington DC: Congressional Research Service, R43433, May 13, 2014).

⁶⁷⁵Zoe Li, "China, Vietnam, Philippines Collide Amid Escalating South China Sea Tensions," CNN, <http://www.cnn.com/2014/05/08/world/asia/south-china-sea-drilling/>.

⁶⁷⁶Wen (辛文) Xin, "The United States Is Suspected of Abandoning Its Bottom Line over U.S.-Vietnamese Nuclear Cooperation (美国政府在美越核合作方面被疑放弃防扩散底线)," *Global Nuclear News (国外核新闻)*, no. 008 (2010); Weiwei (李巍巍) Li, "An Analysis of U.S.-Vietnam Relationship against the Rise of China (中国崛起下的美越外交分析)," *Journal of Harbin University (哈尔滨学院学报)* 34, no. 10 (2013).

States uses nonproliferation as a tool to serve its geostrategic objectives and is willing to selectively implement nuclear nonproliferation standards. As one Chinese expert puts it, “The United States treats proliferant countries differently, according to its own global strategy... This selective nonproliferation policy of the United States seriously undermines the sanctity and authority of the international nonproliferation regime.”⁶⁷⁷

Second, the Chinese nuclear community believes the United States uses coercive measures to impose its own nonproliferation agendas, which are counterproductive to international nuclear nonproliferation efforts. According to Chinese interpretation of U.S. policy, the United States has pursued a “counter-proliferation” policy since the end of the Cold War. The core of this policy is to use coercive measures to preemptively prevent the development of nuclear programs.⁶⁷⁸

The Chinese nuclear community is generally skeptical about the legitimacy of the U.S. counter-proliferation policy.⁶⁷⁹ From its perspective, the international nuclear nonproliferation regime became an independent international institution after it was established. This regime, however, does not fully serve American security interests and is not completely in line with American policy objectives. As a result, the United States has always wanted to impose its own rules over the existing international nonproliferation

⁶⁷⁷Binwei (杜彬伟) Du, "A Commentary About the Nuclear Nonproliferation System and Solutions (防止核武器扩散机制的评析及其出路)," *Socialism Studies (社会主义研究)* 2(2010).

⁶⁷⁸Chen, "Counterproliferation Versus Nonproliferation: Current Debates in International Nuclear Nonproliferation (反扩散与不扩散: 当前国际防止核武器扩散中的争论)."

⁶⁷⁹Wei (李伟) Li, "Analyzing the Strengthening of American Counter-Proliferation Policy and Its Internal Dilemma after the Cold War (析冷战后美国反扩散政策的强化及内在矛盾)," *International Forum (国际论坛)* 3(2005); Yeliang (张业亮) Zhang, "On the United States' "Counter-Proliferation Strategy" (试论美国的“反扩散战略”)," *America Studies (美国研究)* 4(1996).

institution by emphasizing its counter-proliferation strategy. Such U.S. policy is perceived as challenging the existing international nuclear nonproliferation regime.⁶⁸⁰

The U.S. launch of the Proliferation Security Initiative (PSI) in 2003 is seen as an example of the U.S. self-proclaimed role of “legislator” of the international nuclear nonproliferation regime and its overlooking of existing norms of international law.⁶⁸¹

Most Chinese experts have been very critical of PSI and have concerns about its legitimacy and effectiveness. Some have pointed out that PSI would help the formation of a “coalition of the willing,” reduce the restraints of the international legal framework, and split the international nonproliferation community before there is a consensus.⁶⁸² The Chinese government seems to share this view. It has emphasized the importance of resolving the issue of WMD proliferation through political and diplomatic means and within the framework of the United Nations and international law. The Ministry of Foreign Affairs claims to “understand the concern of the Proliferation Security Initiative members about the proliferation of weapons of mass destruction and their delivery vehicles. But the international community has many concerns about the legitimacy, effectiveness, and potential consequences of the interception measures under PSI. The PSI members should take this into serious consideration.”⁶⁸³

⁶⁸⁰Chen, "Counterproliferation Versus Nonproliferation: Current Debates in International Nuclear Nonproliferation (反扩散与不扩散: 当前国际防止核武器扩散中的争论)."

⁶⁸¹Mingjie (杨明杰) Yang et al., "Assessing the "Proliferation Security Initiative" (“扩散安全倡议” 评估)," *Contemporary International Relations* (现代国际关系) 10(2003).

⁶⁸²Jiazhu (石家铸) Shi, "American Nonproliferation Security Initiative and Its Progress (美国防扩散安全倡议及其进展)," *International Forum* (国际论坛) 6, no. 6 (2005); Qinghai (赵青海) Zhao, "Evaluating the "Nonproliferation Security Initiative" (“防扩散安全倡议” 评析)," *International Studies* (国际问题研究), no. 6 (2005).

⁶⁸³Jianchao (刘建超) Liu, "Spokesperson of the Ministry of Foreign Affairs Answered Questions at the Press Conference on December 4, 2003 (2003 年 12 月 4 日外交部发言人在记者招待会上答记者

The Chinese nuclear community holds the same view about U.S. efforts to impose missile technology control regulations over other countries. Starting in the late 1980s, the United States was concerned that the nuclear nonproliferation regime was not enough to address the increasing threat of weapons of mass destruction. Therefore, it wanted to set up a ballistic missile technology control regime to prevent the proliferation of ballistic missiles that could be used as WMD delivery vehicles. The Chinese nuclear community was not enthusiastic about this idea and pointed out that this would not address many alternative means of delivering nuclear weapons, such as cruise missiles, airplanes, etc.⁶⁸⁴ They were also concerned that this would unfairly deprive the right of countries to develop conventional missiles that they perceived as a legitimate need for national defense.⁶⁸⁵

The Chinese nuclear community was even more critical about how the United States implements its missile nonproliferation policy. The United States initiated the Missile Technology Control Regime (MTCR) in 1987, together with six other countries—the United Kingdom, Canada, Japan, Germany, Italy, and France.⁶⁸⁶ By 2014, the MTCR has a total of 34 partner countries (including the United States), and most of the partner countries have already possessed some level of technical capacity on missile

问), "(Beijing: The State Council Information Office of The People's Republic of China (中华人民共和国国务院新闻办公室), December 4 2003).

⁶⁸⁴Xiaojun (李小军) Li, "Institutional Foundation, Institutional Shortcomings, and Institutional Renovation: A Theoretical Reflection on the Missile Technology Control Regime (制度根基, 制度缺陷和制度修复——对“导弹及其技术控制制度”的理论思考)," *International Forum (国际论坛)* 7, no. 1 (2005); Liping (夏立平) Xia, "Ballistic Missile, Proliferation of the Technology, and Its Control in Asia Pacific Region (亚太地区弹道导弹及其技术的扩散和控制)," *International Review (国际观察)* 1(2001); Yuanzhe (任远喆) Ren, "China and Missile Technology Control Regime: Progress and Prospects (中国与“导弹及其技术控制制度”: 进程与前景)," *International Forum (国际论坛)*, no. 2 (2012); Yuan, "The Evolution of China's Nonproliferation Policy since the 1990s: Progress, Problems, and Prospects."

⁶⁸⁵Xiaojun (李小军) Li, "Missile Proliferation and Its Control Regime (导弹扩散及其控制制度)" (Fudan University (复旦大学), 2006).

⁶⁸⁶"Missile Technology Control Regime," <http://www.mtc.info/english/index.html>.

development. The objective of the MTCR is to prevent the transfer of ballistic missiles and related technology with the capability to deliver a payload of more than 500 kilograms to a distance of more than 300 kilometers. The U.S. implementation of this missile nonproliferation regulation, however, has been heavily criticized by the Chinese nuclear community.

The guidelines of the MTCR explicitly prohibit the transfer of any Category I items, regardless of whether the intended recipient country of the technology is an MTCR partner or not.⁶⁸⁷ The United States has imposed severe sanctions on North Korea for developing rockets that can be adapted and used for weapon delivery vehicles but has no problem with countries such as Japan and South Korea developing the same technology.⁶⁸⁸ More importantly, since 1989, the United States has been conducting extensive bilateral cooperation with Japan on the development of Standard Missile 3 (SM-3)—an advanced ballistic missile interceptor. According to the Chinese nuclear community, this SM-3 interceptor, although to be used as a missile interceptor, is essentially itself a ballistic missile that has an inherent delivery capability that exceeds the 500 kilogram/300 kilometer criterion set up by the MTCR. Based on MTCR stipulation, the SM-3 is a Category I item and its technology sharing should be strictly prohibited. U.S. cooperation with Japan on developing this antimissile interceptor is a clear violation of MTCR.⁶⁸⁹ In the eyes of the Chinese nuclear community, the United

⁶⁸⁷The MTCR defines Category I items as missiles that can flight over a distance of more than 300 kilometers with a payload of more than 500 kilograms. Other less capable missiles and related technology are defined as Category II items and receive less strict controls.

⁶⁸⁸Shi, "The Dilemma Facing the International Nuclear Nonroliferation Regime and Korean Nuclear Issue (国际核不扩散体制的困境与朝核问题)."

⁶⁸⁹Xuetong (阎学通) Yan, "Theater Missile Defense System and Northeastern Asian Security (战区导弹防御系统与东北亚安全)," *International Economic Review* (国际经济评论) 4(2000); Tong (赵通) Zhao and

States is willing to sacrifice MTCR rules because it needs to use these cooperation programs to incorporate and keep important regional actors in its security alliance network, which is critical to overall U.S. geostrategic interests.⁶⁹⁰ Similarly, the Arrow-3 interceptor that the United States has been jointly developing with Israel falls into the Category I definition of the MTCR. The SM-2 interceptors that the United States has exported to a number of countries and regions, including the Netherlands, Australia, South Korea, Japan, and Taiwan, are MTCR Category II items. The export of the interceptors by the United States to allies and friends is also viewed as a violation of this regime.⁶⁹¹

U.S. policy regarding MTCR implementation is particularly revealing to the Chinese nuclear community because the MTCR is a U.S.-led nonproliferation regime (rather than an internationally accepted nonproliferation regime such as the NPT), and the United States frequently uses the MTCR to impose sanctions over countries that violate MTCR regulations. Nonetheless, the United States does not want to comply with the MTCR rules themselves and makes frequent exceptions for its allies and friends. This has contributed to the Chinese perception that the United States is not sincere in holding up existing international nonproliferation norms and is willing to impose its own rules when necessary. When the norms and rules run counter to its geostrategic interests, the United

Bin (李彬) Li, "Is the United States Complying with MtcR Rules? (美国遵守 MtcR 规定吗?)," *Quarterly Journal of International Politics* (国际政治科学) 2(2007).

⁶⁹⁰Haining (倪海宁) Ni and Mengjie (李孟洁) Li, "Overview of the "Missile Defense System" Issues in Asia Pacific (亚太地区 “导弹防御系统” 问题综述)," *International data and information* (国际资料信息), no. 5 (2009).

⁶⁹¹Zhao and Li, "Is the United States Complying with MtcR Rules? (美国遵守 MtcR 规定吗?)."

States is ready to ignore them.⁶⁹² For this reason, the Chinese nuclear community prefers that the United Nations and the International Atomic Energy Agency play a bigger and more authoritative role in managing the international nuclear nonproliferation regime.⁶⁹³

In summary, from the perspective of the Chinese nuclear community, the United States pursues its own counter-proliferation policy, which is different from nonproliferation. The counter-proliferation policy relies more on unilateral and coercive means rather than international institutions and multilateralism. The ultimate objective is to assure the U.S. “absolute security,” national interests, and technological monopoly, rather than to ultimately eliminate nuclear weapons and maintain global and regional stability, and it has much less legitimacy in terms of international norms and international law.⁶⁹⁴

Norms and China’s Nuclear Nonproliferation Policy

Normative Consideration in China’s Nuclear Nonproliferation Policy

From the perspective of the Chinese nuclear community, normative consideration has been part of China’s thinking on its nuclear nonproliferation policy. In Chinese internal deliberation, the normative demand from developing countries has very much driven China’s adjustment of its nuclear nonproliferation policy. For instance, China’s decision to join the NPT was significantly influenced by the growing acceptance of NPT by

⁶⁹²Ruyi (康和意) Kang, "Analyzing the Nuclear Nonproliferation Policy of the George W. Bush Administration (试论美国小布什政府的防核扩散政策)" (Foreign Affairs University (外交学院), 2009).

⁶⁹³Chen, "The International Nuclear Proliferation Crisis: Status Quo, Root Causes, and Countermeasures (全球核扩散危机: 现状, 根源及对策)."

⁶⁹⁴Chen, "Counterproliferation Versus Nonproliferation: Current Debates in International Nuclear Nonproliferation (反扩散与不扩散: 当前国际防止核武器扩散中的争论)."; Yuan, "The Evolution of China's Nonproliferation Policy since the 1990s: Progress, Problems, and Prospects."; Deyi (温德义) Wen, "Shield and Sword: The Acceleration of Japan's Building of Ballistic Missile Defense System and Its Impact (盾与刀——日本加速建立弹道导弹防御系统及影响)," *Modern Weaponry (现代兵器)* 1(2006).

developing countries. During the 1980s, a large number of developing countries began to accept the grand bargain inherent in the NPT and started to join the treaty. The Chinese nuclear community recognized this new trend and argued that China should respect the will of “the majority of nonnuclear countries” and be more proactive in joining the treaty. ZouYunhua, for example, stressed in 1990 that the NPT “has become one of the arms control treaties in the world that [has the] most participating countries. The establishment of the Treaty and the wide participation of countries in the Treaty [are] a reflection of the demand of the international community for achieving nuclear disarmament, eliminating nuclear threat, and maintaining international peace. The Treaty also conveys the hope of the majority of the nonnuclear weapons states to give up their right of obtaining nuclear weapons in order to promote nuclear disarmament ... in exchange for assistance with civilian use of nuclear energy.”⁶⁹⁵ China’s support for the unconditional and infinite extension of the NPT at the 1995 NPT Review Conference was also very much a direct response to the demand of the developing countries.⁶⁹⁶

From the realist perspective, as an officially recognized nuclear weapons state under NPT, China should have more common interests with other nuclear weapons states on nonproliferation issues. But China has traditionally identified itself with the developing countries and has been much more willing to respond to the appeals of developing countries on nonproliferation issues. Even after China joined the NPT, China has still been very critical about the unfairness of the NPT and the imbalance between nonproliferation obligations and the legitimate needs of developing countries for nuclear

⁶⁹⁵Zou, "Non-Proliferation of Nuclear Weapons - an Observation on the Eve of the Fourth Npt Reveiw Conference (不扩散核武器——写在《不扩散核武器条约》缔约国第四次审议会议之前)."

⁶⁹⁶Johnston, *Social States: China in International Institutions, 1980-2000*.

energy development assistance and technology transfer.⁶⁹⁷ It has been one of the most vocal defenders of the right of developing countries to peaceful use of nuclear energy and argues that countries with advanced nuclear energy technology should collaborate with developing countries in nuclear energy development in order to help developing countries to achieve the economic benefits of nuclear energy.⁶⁹⁸

China's resistance to join supply-side nuclear control international organizations is also directly linked to its tendency to defend the right of developing countries of peaceful use of nuclear energy. For a long time, China did not submit an application to join the Nuclear Suppliers Group, even though China met all the requirements of joining NSG. This was primarily out of the concern that hindering the transfer of nuclear goods and technology for peaceful purposes is unfair and discriminatory. Its view was that nonproliferation should not be pursued at the cost of the developing countries' peaceful use of nuclear energy.⁶⁹⁹

In contrary to the argument that U.S. pressure is the primary driving force behind China's nuclear nonproliferation policy, China has become more willing to play a positive role in nuclear nonproliferation issues, which it believes represents an "international consensus" (国际共识). For example, the U.S.-Sino relationship was at a very low point in 2000 as a

⁶⁹⁷Yuan, "The Evolution of China's Nonproliferation Policy since the 1990s: Progress, Problems, and Prospects."

⁶⁹⁸"Statement of the Chinese Delegation About Peaceful Use of Nuclear Energy at the Third Preparatory Meeting of the Eighth Review Conference of the Nuclear Nonproliferation Treaty (中国代表团在《不扩散核武器条约》第八次审议大会第三次筹备会上关于和平利用核能问题的发言)," (New York May 2009); Jinzhang (李金章) Li, "Speech of Vice Minister of Foreign Affairs Li Jinzhang at the Opening Ceremony of the Seventh U.S.-China Arms Control, Disarmament, and Nonproliferation Workshop 李金章副部长在第七次中美军控、裁军与防扩散研讨会开幕式上的讲话)," (Beijing: Ministry of Foreign Affairs of The People's Republic of China, December 16 2009).

⁶⁹⁹Jiao, "A Balance of Interests: The Role of the United States in China's Participation in International Institutions (利益的权衡: 美国在中国加入国际机制中的作用)."; Weixing Hu, "China's Nuclear Export Controls: Policy and Regulations," *The Nonproliferation Review* 1, no. 2 (1994).

result of the 1999 embassy bombing. The U.S. Senate's rejection of the CTBT also greatly disappointed China. The United States was very concerned that China might not be very cooperative at the 2000 NPT Review Conference as a result. However, China turned out to play a very positive role at the review conference and this trend has continued. China also actively supported and participated in nuclear nonproliferation initiatives within the ASEAN Regional Forum and the Asia-Pacific Economic Cooperation.⁷⁰⁰

Chinese resistance to using economic sanctions as a nonproliferation tool also reflects an element of normative consideration. China has a long-held view that economic sanctions employed by “hegemonic powers” are coercive and discriminatory. Its own experience of undergoing serious economic sanctions imposed by the United States, the Soviet Union, and other Western countries reinforces its perception about the negative humanitarian consequences of economic sanctions.⁷⁰¹ China has been particularly opposed to strategic economic sanctions—those that use large-scale and highly intensive sanctions to target and undermine key economic infrastructure of the target country in order to delegitimize, contain, undermine, or even topple the regime of the target state.⁷⁰² As a result, China has always resisted any efforts to impose strategic economic sanctions over Iran, North Korea, or other countries even though China shares the same objective with the United States

⁷⁰⁰Medeiros, *Reluctant Restraint: The Evolution of China's Nonproliferation Policies and Practices, 1980-2004*.

⁷⁰¹Gang (肖刚) Xiao and Guohua (黄国华) Huang, "Unilateral Economic Sanctions in America's Economic Diplomacy after the Cold War (冷战后美国经济外交中的单边经济制裁)," *International Economics and Trade Research (国际经贸探索)* 22, no. 3 (2006).

⁷⁰²Liang (阎梁) Yan, "China's Economic Sanctions: Objectives and Policy Issues (中国对外经济制裁: 目标与政策议题)," *Foreign Affairs Review (外交评论)* (2012); Yongsheng (周永生) Zhou and Lin (李琳) Li, "Political and Economic Objectives of Economic Sanctions and Assessment (经济制裁的政治经济目的及其评价)," *Guihai Tribune (桂海论丛)* 20, no. 1 (2004).

and other countries on nuclear nonproliferation in these regions. China also has always insisted that any economic sanctions should be sponsored by the United Nations. It opposes unilateral sanctions without the authorization of the U.N. Security Council. Its own limited economic sanctions in recent years against North Korea were also only carried out strictly according to U.N. mandates and within the U.N. framework.⁷⁰³

Nonproliferation Norms and Increasing Chinese Pragmatism

Believing that the United States wants to impose its own rules beyond the internationally accepted nonproliferation norms and regulations, China responds in a similarly *realpolitik* manner. China does not see the U.S.-driven missile nonproliferation as part of the legitimate international nuclear nonproliferation regime and therefore chooses to cooperate only when it serves its geostrategic interests. One of the tactics that China employs is to use issue linkage as leverage. It makes a connection between China's cooperation on missile nonproliferation and the U.S. arms sale to Taiwan, especially the U.S. sale of missile defense systems to Taiwan and the incorporation of Taiwan into the U.S. regional missile defense network.⁷⁰⁴ On a few occasions, China has reduced its cooperation on missile nonproliferation in the form of deliberate lapse in export control enforcement in order to put pressure on the United States against its arms sale to Taiwan. This has happened repeatedly since the 1992 U.S. sale of 150 F-16 fighter aircrafts till the

⁷⁰³Meihua (金美花) Jin, "Crisis Escalation on the Korean Peninsula and China's Role (朝鲜半岛危机升级与中国的作用)," *World Affairs* (世界知识), no. 8 (2013).

⁷⁰⁴Jishe (樊吉社) Fan, "U.S. And Chinese Arms Control: Cooperation, Divergence, Motivations, and Future Trend (中美军控: 合作与分歧, 动因与走势)," *International Economic Review* (国际经济评论), no. 5 (2001); Henry Sokolski, "Us Satellites to China: Unseen Proliferation Concerns," *International Defense Review* 27(1994); Yuan, "The Evolution of China's Nonproliferation Policy since the 1990s: Progress, Problems, and Prospects."

2000s. The Chinese nuclear community believes that such issue linkage has helped reduce the frequency and quantity of U.S. arms sales to Taiwan.⁷⁰⁵

Although China does not accept the U.S.-led nonproliferation rules as legitimate, it has become more pragmatic in implementing its nonproliferation policy. The Chinese nuclear community has always been critical about the United States using domestic laws such as the Iran Nonproliferation Act and the Iran, North Korea, and Syria Nonproliferation Act to discipline the export of Chinese companies and see this as evidence of U.S.

“hegemonism” and “unprincipled power politics.”⁷⁰⁶ But the Chinese nuclear community has realized, over extensive communications, that it serves Chinese economic interests to make practical concessions to the U.S. requirement. Many Chinese companies have set up internal sensitive countries export control lists that essentially put countries such as Iran, Syria, Iraq, and others on a blacklist. They have voluntarily abstained from exporting certain goods to these countries or have put much stricter export restrictions on these countries in order to meet the requirements of the United States and to avoid U.S. sanctions. The Chinese government also seems to have been increasingly receptive to such de facto discriminatory export control policies against countries that are targeted by the United States.

⁷⁰⁵ Jiao, "A Balance of Interests: The Role of the United States in China's Participation in International Institutions (利益的权衡: 美国在中国加入国际机制中的作用)."

⁷⁰⁶ Jianping (胡剑萍) Hu and Jianping (阮建平) Ruan, "The U.S. Overseas Economic Sanctions and Conflict Analysis (美国域外经济制裁及其冲突探析)," *World Economics and Politics (世界经济与政治)*, no. 5 (2006); Penghong (蔡鹏鸿) Cai, "The U.S. Sanctions on Iran and Its Impact on China (美国制裁伊朗及其对中国的影响)," *Contemporary International Relations (现代国际关系)* 4(2012); Jianying (颜剑英) Yan and Jinxiu (罗锦秀) Luo, "New Development of U.S. Economic Sanctions after the End of the Cold War (冷战结束后美国对外经济制裁的新发展)," *Theory Guide (理论导刊)*, no. 2 (2005); Daofu (鲁道夫) Lu, Jianzhong (黄建中) Huang, and Qi (宫齐) Gong, "Unprincipled Power: Ethical Issues Related to International Economic Sanctions (无原则的强权--国际经济制裁的伦理问题)," *Digest of Modern Foreign Philosophy and Social Sciences (现代外国哲学社会科学文摘)* 5(1999).

There are other signs that the Chinese nuclear nonproliferation policy is becoming more pragmatic and less norm-oriented over the last decade. The Chinese nuclear community has played an important role in making this happen. On the issues of using economic sanctions as a nonproliferation tool, the Chinese nuclear community studied the experience of the United States and other countries in employing various types of economic sanctions and systematically explored the legal, ethical, political, and financial implications of economic sanctions.⁷⁰⁷ They challenged the traditional Chinese view that economic sanctions are unconditionally immoral, illegal, and unjust⁷⁰⁸ and admitted that economic sanctions “ha[ve] been widely accepted as part of international law, and ha[ve] played a positive role in maintaining international peace.”⁷⁰⁹ Compared to the Chinese traditional opposition to economic sanctions, the nuclear community has been pushing for a greater acceptance of using economic sanctions. They promoted the view that economic sanctions should be a tool in the toolbox, although China needs to be “careful on sanctions.”⁷¹⁰ On North Korea, they argued that “as one of the tools for addressing international relation issues, sanctions should also be used in the practice of resolving the

⁷⁰⁷See, for example, Yan, "China's Economic Sanctions: Objectives and Policy Issues (中国对外经济制裁: 目标与政策议题)."; Liang (阎梁) Yan and Jinwen (何劲汶) He, "European and American Economic Sanctions against Iran: Policy Divergence and Convergence (欧盟、美国对伊朗的经济制裁: 政策分歧及其弥合)," *European Studies (欧洲研究)*, no. 3 (2012); Shuguang (张曙光) Zhang, "U.S. Strategic Thinking on Economic Sanctions and Its Decision-Making on Embargo against China, 1949-1953 (美国关于经济制裁的战略思考与对华禁运决策 (1949-1953))," *International Politics (国际政治研究)*, no. 3 (2008); Yong (刘勇) Liu, "An Legal Analysis of U.S. Economic Sanctions (美国经济制裁的法律分析)" (Suzhou University (苏州大学), 2009).

⁷⁰⁸Bin (石斌) Shi, "Effective Sanctions and "Just Sanctions": On the Political Motivation and Ethical Dimensions of International Economic Sanctions (有效制裁与“正义制裁”——论国际经济制裁的政治动因与伦理维度)," *World Economics and Politics (世界经济与政治)*, no. 8 (2010); Xianyu (余先予) Yu, "The Coordination of International Law and Domestic Law (论国际法与国内法的协调)," *Journal of Shanghai University of Finance and Economics (上海财经大学学报)* 2, no. 2 (2000).

⁷⁰⁹Lirong (杜栎荣) Du, "The Impact of International Sanctions on Resolving the North Korean Nuclear Issue (国际制裁对解决朝核问题的影响)" (Yanbian University (延边大学), 2012).

⁷¹⁰Hong Li, "Chinese Nonproliferation Policy and Export Control Practice," (China Arms Control & Disarmament Association (CACDA), August 28, 2013).

Korean nuclear issue.”⁷¹¹ This has started internal discussions about the feasibility of employing economic sanctions. The Chinese government’s recent small-scale sanctions against North Korea after its nuclear and rocket/missile tests seemed to be indicators of the influence of this “rethink” on its position on economic sanctions.⁷¹²

Since early 2013, China has adopted a series of economic measures against North Korea. Some of these measures were even considered more restrictive than the stipulations of recent U.N. Security Council resolutions on North Korea. Table 17 provides a summary of economic measures taken by China after the third nuclear test. In the financial sector, four of China’s major commercial banks closed some North Korean accounts that had suspected links with WMD programs in May 2013. In September, China released a list of export control items that could be used by North Korea in its nuclear and missile programs. China also cut off oil supply to North Korea for six months starting in February, which was once widely seen as an indicator of “real” punishment from China.⁷¹³

⁷¹¹Du, "The Impact of International Sanctions on Resolving the North Korean Nuclear Issue (国际制裁对解决朝核问题的影响)."

⁷¹²Jin, "Crisis Escalation on the Korean Peninsula and China's Role (朝鲜半岛危机升级与中国的作用)."; Liangui (张琏瑰) Zhang, "2013: The "Decisive Battle" of the North Korean Nuclear Issue (2013 年: 朝鲜核问题 “收官之战”)," *Theoretical Trends (理论动态)*, no. 7 (2013).

⁷¹³"China for the First Time Cut Off Oil Supply to North Korea for Three Consecutive Months (中国首次连续 3 个月断供朝鲜石油)," *Yonhap News Agency* April 25 2013.

Table 17 Summary of China's Economic Sanctions against North Korea since Its Third Nuclear Test

Time	Measures
2013 (Mar)	Representative offices of some North Korean banks closed
2013 (Apr)	Minister of Transportation mandated strict implementation of UNSCR 2087
2013 (May)	Suspicious North Korean accounts closed by four major banks
2013 (May)	Heightened customs inspection of goods bound for DPRK
2013 (Feb-Jul)	Oil supply cut-off for six months
2013 (Sep)	Release of list of prohibited dual use export

In general, normative consideration has been a part of China's nuclear nonproliferation policy-making. But China's understanding of nonproliferation norms is much more in line with that of the developing countries than with that of the United States. Moreover, long-term operational-level engagement has not changed the Chinese nuclear community's view that the U.S. nonproliferation policy is more geostrategic-interest oriented than norm-compliance oriented. As a result, the Chinese nuclear community has increasingly focused on the calculation of geostrategic interests in policy analysis and discussions. Normative consideration is becoming less important in China's nonproliferation thinking. This has actually undermined the foundation of moralistic trust, which is based on the appreciation of the importance of norms and the recognition of shared moral/normative rules.

CHAPTER FIVE

CONCLUSION

Summary of Findings

The most important finding of this research is that operational-level engagement between the United States and China on nuclear issues is very effective in increasing Chinese strategic trust toward the United States but is not very helpful in increasing moralistic trust. This conclusion is reached by examining the proposed hypotheses in chapter one.

In terms of strategic trust, there are three specific hypotheses, and the three case studies provide strong empirical evidence to accept these hypotheses:

Hypothesis 1A: Operational-level engagement promotes the growth and expansion of a Chinese nuclear community that shares a common vocabulary with the U.S. nuclear community and understands important concepts used by the U.S. nuclear community.

U.S.-Chinese engagement on CTBT was the first systematic and intensive operational-level engagement on nuclear issues. Many Chinese nuclear scientists, policy practitioners, and analysts started their first interaction with American colleagues as a result of CTBT-related engagement programs. They were introduced to this new policy research subject and came to the recognition that they could play as important a role in influencing Chinese nuclear policy-making as their American colleagues did in the United States. Operational-level engagement directly led to the emergence of China's own nuclear

community. After the CTBT negotiations finished, U.S.-Chinese engagement continued to drive the growth and expansion of the Chinese nuclear community. Such bilateral engagement on a range of nuclear arms control and nonproliferation issues attracted more and more Chinese professionals from an increasing number of governmental and nongovernmental agencies to get interested in and become part of the Chinese nuclear community. During this process, the Chinese and American participants in these dialogues and exchanges felt the need to clarify the terms and language they were using and therefore cooperated to develop a common vocabulary. All these proved the causal connection between operational-level engagement and the growth of the Chinese nuclear community.

Hypothesis 1B: Operational-level engagement helps the Chinese nuclear community to recognize new areas of common interest with the United States and to become more motivated in pursuing cooperation with the United States to achieve these newly recognized common interests.

Operational-level engagement helps the Chinese nuclear community to recognize new areas of common interest with the United States in a few ways. First of all, technical exchanges changed China's calculation of interests. In the case of CTBT engagement, Chinese nuclear scientists were very much interested in exploring the perceived benefits of peaceful nuclear explosion for large-scale civil construction projects, but their lack of research and empirical experience in this area made them unlikely to understand the potential costs and obstacles. Their American colleagues, however, had extensive experience in this area and had conducted a relatively large number of nuclear explosions to test their potential civilian utility. Based on their real-world experience, American

scientists had a more comprehensive understanding of the benefits and the serious problems with peaceful nuclear explosion. Their engagement with Chinese nuclear scientists provided an opportunity for them to share their experience, which partly contributed to the change of Chinese calculation of interests on this subject.⁷¹⁴

Operational-level engagement changed the Chinese nuclear community's simplistic understanding on a range of important issues such as nuclear nonproliferation. As the case on nuclear nonproliferation shows, the Chinese nuclear community used to subscribe to the traditional Chinese view that breaking the nuclear monopoly and making nuclear weapons available to more countries contributed to international peace and stability and therefore did not cause nuclear proliferation to have a negative impact on China's security interests. It was their engagement with American colleagues that prompted them to develop a much more sophisticated understanding of the potential consequences of nuclear proliferation and the problem of simply dividing countries into evil superpowers and peace-loving countries. After the Chinese nuclear community began to embrace a more nuanced understanding of nuclear nonproliferation, it realized that instead of having conflicting interests, it actually shared a lot of common interests with the United States. This became the starting point of China's policy change on nonproliferation.

From their American colleagues, the Chinese nuclear community learned Western arms control theories and accepted the general analytical framework. As Chinese nuclear analysts began to look at nuclear policies through the same theoretical lenses as the Americans, their understanding of nuclear deterrence, stability, and arms control in

⁷¹⁴Zhao, "Track Two Dialogue between the U.S. And China on Ctbt Negotiations (二轨外交与中美全面禁止核试验条约谈判)."

general began to converge. This also changed China's overall understanding of its security interests and in many cases helped the Chinese realize that they shared common interests with the United States.

Moreover, operational-level engagement helps build the Chinese nuclear community's technical and practical capacity to achieve newly recognized common interests.

American and Chinese nuclear scientists cooperated to develop new arms control verification instruments and technologies that strengthened China's confidence in CTBT and other international arms control regimes. Bilateral training programs helped China bring up a new generation of export control experts across relevant government agencies and the defense industry. These experts learned best practices from the United States about export control implementation methods. Based on the U.S. model of strategic good management, China changed its export control system from one based on administrative control to one based on laws and legal regulations. All these have helped China to move forward in areas in which it perceives as sharing increasing common interests with the United States.

Hypothesis 1C: The Chinese nuclear community is able to convince the top leadership that these new areas of common interest are real and worth pursuing in cooperation with the United States.

In all three cases, operational-level engagement helps bring about a better internal interagency coordination mechanism in China on nuclear policies. The growth and expansion of the Chinese nuclear community gradually broke the bureaucratic boundaries between traditionally stovepipe governmental organizations. Many U.S.-Chinese

dialogues and exchange programs themselves served as unprecedented opportunities for Chinese experts from different sectors and organizations to meet and communicate with each other. Inspired by their American colleagues, members of the Chinese nuclear community from different government agencies actively sought to establish cross-agency communication channels. Such interagency communication and coordination mechanisms help the Chinese nuclear community to speak with the same voice and promote the same policy agendas.

Under such a coordinated effort, the Chinese nuclear community initiated domestic discussions to rethink China's policies such as the nuclear test ban, missile defense, and nuclear nonproliferation, which ultimately resulted in significant policy change at the official level. Using internal, bottom-up communication channels and open publication and advocacy, the Chinese nuclear community was able to convince the Chinese top leadership that it was in China's interest to prepare for a comprehensive test ban, to pursue a nuclear strategy that contributes to stability, and to counter nuclear proliferation.

As for moralistic trust, there are three specific hypotheses to be examined. The first hypothesis (Hypothesis 2A) is the same as Hypothesis 1A, which is already accepted based on empirical evidence.

Hypothesis 2B: Operational-level engagement helps the Chinese nuclear community to recognize and/or accept more common moral/normative principles with the United States on nuclear arms control and nonproliferation issues.

China's domestic discussions reveal that normative consideration indeed affects the Chinese nuclear community's thinking and policy deliberation. However, their

understanding of international norms is more in line with that of the developing countries than with that of the United States. They are more willing to respond to normative demands from nonaligned countries than the United States. Operational-level engagement does not seem to have changed this.

Operational-level engagement provides the Chinese nuclear community with the opportunity to closely monitor domestic policy debates in the United States and to develop a deeper understanding about U.S. nuclear policy-making. However, this does not seem to have led the Chinese nuclear community to develop a more favorable understanding of the moral/normative principles behind the U.S. nuclear policy. After decades of engagement, the Chinese nuclear community still believes that U.S. nuclear policy-making is primarily guided by the following principles: pursuit of “absolute security,” technology supremacy, and peace through strength. It believes that the United States is more than willing to sacrifice or circumvent internationally accepted norms such as nuclear nonproliferation in order to achieve its geostrategic objectives. This has, in fact, encouraged the Chinese nuclear community to focus increasingly on calculations of geostrategic interests in their policy discussions. Normative consideration is receiving less attention and is becoming less important. The lesson that the Chinese nuclear community draws from observing U.S. nuclear policy-making is that China’s security depends on its strength and material capability as the most important source of leverage in international negotiations. Chinese nuclear thinking has become more *realpolitik* rather than less. This contradicts the hypothesis that operational-level engagement helps the Chinese nuclear community to recognize and/or accept more common moral/normative principles with the United States. Therefore, Hypothesis 2B has to be rejected.

Hypothesis 2C: The Chinese nuclear community is able to convince the top leadership that the United States and China share important moral/normative principles in their respective nuclear policy thinking.

Since Hypothesis 2B is rejected, Hypothesis 2C cannot be accepted. In fact, as discussed in chapter four, the Chinese nuclear community shares the same view with the Chinese top leadership on moral/normative considerations of China's nuclear policy. There is sufficient bottom-up communication and no significant perception gap between the nuclear community and the top leadership. In summary, operational-level engagement between the United States and China on nuclear issues increases China's strategic trust toward the United States but does not increase China's moralistic trust toward the United States.

Theoretical Contribution

Existing literature in IR does not answer the following questions: (a) whether trust-building is possible in an anarchic international system,⁷¹⁵ (b) whether engagement is able to build trust,⁷¹⁶ and (c) how effective are different approaches of engagement (bottom-up engagement vs. top-down engagement) in building trust.⁷¹⁷ These are critical questions that have important implications for deepening our understanding of IR theories. For the first and second questions, this research shows that whether trust-building is possible in an anarchic system and whether engagement is able to build trust

⁷¹⁵Xuetong Yan, "The Instability of China–Us Relations," *The Chinese Journal of International Politics* 3, no. 3 (2010); Zhang, *China in International Society since 1949: Alienation and Beyond*.

⁷¹⁶Kenneth Lieberthal, "A New China Strategy," *Foreign Affairs* (1995); Economy and Oksenberg, *China Joins the World: Progress and Prospects*.

⁷¹⁷Sun, "Building a Security Community in the Asia-Pacific Region: Dilemmas and Prospects."; Wheeler, "The Challenges to Trust-Building in Nuclear Worlds Project Practitioners Meeting Report."

depend on what trust means. Based on the existing literature on trust, this research proposes that a better way to understand trust is to distinguish “strategic trust” from “moralistic trust.” Empirical study in this research has proved that such categorization highlights the fundamental differences between the two types of trust and is very helpful for understanding the specific trust-building mechanisms.

This research uses the most conservative cases for understanding trust. It finds that it is possible to build strategic trust even on highly sensitive national security issues such as nuclear arms control and nonproliferation. It challenges the realist theories, which completely dismiss the issue of trust in IR in general, let alone in the issue area of arms control and international security.⁷¹⁸ The most important challenge that this research poses to rationalist theories in general is that it rejects the rationalist assumption that a state’s interests are predetermined and clearly understood. Rationalists believe a state’s interests are determined by the structure of the international system, the state’s position in the system and its security environment, among other things, and can be objectively evaluated.⁷¹⁹ This research finds that a state’s preferences are more determined by its perception of its interests rather than its “real” interests understood in an objective matter. In fact, whether the assumed objective and “real” interests exist is questionable. In any case, a state’s perception of its own interests determines its preferences and objectives. One’s perception of interests constantly changes and is subject to influence. In this regard, the process of building strategic trust is a process in which one’s perception of interests

⁷¹⁸Mearsheimer, "The False Promise of International Institutions."; "Back to the Future: Instability in Europe after the Cold War."

⁷¹⁹Buzan, Jones, and Little, *The Logic of Anarchy: Neorealism to Structural Realism*; Lynch, "Why Engage? China and the Logic of Communicative Engagement."; Guzzini, "Structural Power: The Limits of Neorealist Power Analysis."

gets influenced and changed and in which one comes to the recognition that it shares more common interests with the other than it originally thought.

This research points out that a state does not always understand there are common interests at the inception of its interaction with the others. It traces an incremental process of convergence toward common interests among states that at first do not conceive of such common interests. This goes beyond the traditional rationalist approach, which tends to focus on interests at separated single points of time or in separate single occasions.

The third question is which engagement approach (bottom-up vs. top-down) is more effective in building trust. Some scholars have argued that the top-down approach is more effective because there are few actors at the top level, which makes it easier to reach agreement without too much public pressure. For example, Tony Armstrong states, “[N]egotiations that successfully lead to a rapprochement are conducted at a high level, are nonpublic, and involve the fewest possible participants.”⁷²⁰ These scholars provide a few reasons to support their argument. They believe high-level talks are free from public attention and public pressure. Public attention can make the decision makers less likely to openly express their interests or to make necessary compromises.⁷²¹ Public deliberation can make decision makers more interested in “playing to the passions of their audience than reaching rational consensus.”⁷²² Therefore, secrecy at the high level

⁷²⁰Tony Armstrong, *Breaking the Ice: Rapprochement between East and West Germany, the United States and China, and Israel and Egypt*(United States Institute of Peace Press Washington, DC, 1993).

⁷²¹Jon Elster, "Strategic Uses of Argument," in *Barriers to Conflict Resolution*, ed. Kenneth Joseph Arrow(WW Norton & Company, 1995); *Deliberative Democracy*, vol. 1(Cambridge University Press, 1998); Lynch, "Why Engage? China and the Logic of Communicative Engagement."

⁷²²Michael N Barnett, *Dialogues in Arab Politics: Negotiations in Regional Order*(Columbia University Press, 1998); Lynch, "Why Engage? China and the Logic of Communicative Engagement."

“allows flexibility by excluding rigid bureaucracies and interest group pressure, facilitates a focus on shared strategic interests rather than on contentious political issues and builds trust between top officials prior to bringing the new relationship into the open.”⁷²³

The findings of this research show that the Chinese top leadership at the beginning embraced distinctively different perceptions from their American colleagues on fundamental issues including what is the role of strategic weapons, what contributes to or undermines stability, and what are each other's interests. It is difficult to imagine that high-level talks would have been able to change their perceptions. Instead, as this research shows, such perception change mostly takes place at the operational level as a result of extensive engagement. This perception change at the operational level then gradually influenced the perception of the leadership at the top. Operational-level engagement does involve a much larger number of players, but it does not necessarily bring more public pressure. If conducted in a semi-closed environment, as most of U.S.-Chinese nuclear engagement programs were, operational-level engagement is effective in promoting open discussions.

This research shows operational-level engagement contributes to the growth of strategic trust through the building and growing of an epistemic community. Engagement brings about better internal interagency coordination within this community and facilitates bottom-up communication and influence between the community and the top leadership. This research confirms the effect of “argumentation” raised by some scholars. Checkel and Risse believe that if players are placed in an environment that is relatively insulated

⁷²³“Why Engage? China and the Logic of Communicative Engagement.”

from political pressure, they may be able to open themselves to persuasion by good arguments.⁷²⁴ This “act of argumentation” actually takes place at the operational level. U.S.-Chinese high-level official dialogue on nuclear issues, which started in the mid-2000s, usually took place in a politically charged environment and on a far less regular basis than operational-level engagement. This makes the “act of argumentation” less likely to take place during high-level official dialogues. In contrast, there is very visible evidence for “persuasion by good arguments” that took place during operational-level engagement. The Chinese nuclear community learned and accepted Western arms control theories and used them to guide China’s own nuclear policy. They also gradually embraced Western concepts and changed their perceptions on a range of key issues such as deterrence, strategic stability, nonproliferation, etc., which are now very much in line with mainstream Western understanding. This perception change at the operational level leads to the Chinese nuclear community’s reassessment of their national interests.

There is a general belief that operational-level engagement can reduce or resolve deeper disagreements, such as disagreements about identity, ideological beliefs, and moral principles and therefore increase trust.⁷²⁵ People who make arguments along this line believe that growth of this deeper type of trust requires broad participation by a large number of civil society members through some sort of people-to-people exchange, which can lead to fundamental change in interstate relations.⁷²⁶ U.S.-Chinese nuclear

⁷²⁴Jeffrey T Checkel, "Why Comply? Social Learning and European Identity Change," *International organization* 55, no. 03 (2001); Thomas Risse, "'Let's Argue!': Communicative Action in World Politics," *ibid.* 54, no. 01 (2000); Lynch, "Why Engage? China and the Logic of Communicative Engagement."

⁷²⁵Lee Teng-hui, "Understanding Taiwan-Bridging the Perception Gap," *Foreign Affairs* 78(1999); Baogang He, "The Role of Civil Society in Defining the Boundary of a Political Community: The Cases of South Korea and Taiwan," *Asian Studies Review* 23, no. 1 (1999).

⁷²⁶Constantin Holzer and Haibin Zhang, "The Potentials and Limits of China–Eu Cooperation on Climate Change and Energy Security," *Asia Europe Journal* 6, no. 2 (2008); Lena C Endresen and Signe Gilen,

engagement resembles this type of broad engagement among all relevant players at the operational level. However, moralistic trust does not increase as a result.

Growth of moralistic trust depends on convergence of moral/normative principles held by the respective nuclear communities. This research shows that operational-level engagement does not necessarily have a positive impact in this regard. Chinese perceptions that the United States follows *realpolitik* rules rather than international norms and moral principles gets reinforced after decades of engagement. This has encouraged the Chinese nuclear community to attach less importance to moral/normative considerations in its policy deliberation. Instead of converging moral/normative principles, there is less common ground for shared moral/normative principles. The argument that broad-based engagement increases moralistic trust is problematic.

Policy Implications

As China's economic and military capability continues to increase, it is becoming increasingly difficult to implement a containment strategy. Most strategists argue that the United States should continue engaging China in order to influence China's policies in a direction that does not contradict U.S. objectives and interests.⁷²⁷ The issue is, what is the most effective way to engage China? As mentioned above, some scholars argue that

"Consultations and Consensus: Implementing the Israeli-Palestinian People-to-People Programme for Development," *Development* 43, no. 3 (2000); Pavlos E Michaelides, "Interfaith Dialogue in Global Perspective and the Necessity of Youth Involvement," *Asia Europe Journal* 7, no. 3-4 (2009); Yale Richmond, *Cultural Exchange and the Cold War: Raising the Iron Curtain* (Penn State Press, 2010).

⁷²⁷William H Perry, "Us Strategy: Engage China, Not Contain It," *remarks delivered to the Washington State China Relations Council* (1995); R Bradford Leininger, "China 2015: Us National Strategic Policy Now and Then," (DTIC Document, 1996); Thomas J Christensen, "Fostering Stability or Creating a Monster? The Rise of China and Us Policy toward East Asia," *International security* 31, no. 1 (2006).

engagement should focus on Chinese senior officials.⁷²⁸ The Chinese themselves also hold the view that trust-building should start at the top level.⁷²⁹ In practice, however, in the field of nuclear arms control and nonproliferation, high-level official dialogues have shown limitations in building trust. Nuclear arms control and nonproliferation are not as important issues to Chinese top leaders as to U.S. leaders. Chinese top leaders (except Mao and Deng) are not particularly interested in spending time and energy on nuclear policy. This lack of high-level attention from the Chinese side explains the relatively rare high-level official dialogues between the United States and China. Nuclear issues did not receive significant attention in previous high-level dialogues, and most of the nuclear-related discussion was repetition of official lines without much substance.⁷³⁰

The operational-level engagement, therefore, offers the best hope for narrowing the gap between the two countries on nuclear policy. However, some analysts are too optimistic about the impact of operational-level engagement and believe that such engagement can in the long run fundamentally change the nature of the relationship.⁷³¹ This research shows that operational-level engagement has not increased moralistic trust over the past three decades and probably is not going to do so in the near future. After the Chinese

⁷²⁸Armstrong, *Breaking the Ice: Rapprochement between East and West Germany, the United States and China, and Israel and Egypt*.

⁷²⁹Qianyi (舒前毅) Duan, "Sino-American Mutual Trust Building in the 21 Century (21 世纪中美建立互信研究)" (Central China Normal University (华中师范大学), 2008); Yongjie (倪永杰) Ni, "Enhance Political Trust, Deepen Peaceful Development (增进政治互信, 深化和平发展)," (Shanghai: Shanghai Taiwan Research Institute (上海台湾研究所), 2013).

⁷³⁰Lu, "U.S.-China Arms Control Interaction and Its Theoretical Analysis (中美在军控领域的交流及其理论分析)."; "The United States and China Held Strategic Security, Multilateral Arms Control, and Nonproliferation Dialogue (中美举行战略安全、多边军控和防扩散磋商)"; "Background Information: U.S.-China Strategic Dialogue (背景资料: 中美战略对话)."

⁷³¹Yandong (刘延东) Liu, "Deepening Sino-American People-to-People Exchange and Building a New Type of Great Powers Relationship: Speech at the Third Round of Sino-U.S. People-to-People Exchange High-Level Consultation Meeting (深化中美人文交流, 构建新型大国关系——在第三轮中美人文交流高层磋商会议上的讲话)," (Beijing: Ministry of Education of the People's Republic of China, May 4 2012).

nuclear community develops a more sophisticated understanding of U.S. nuclear policy-making, its view that the United States pursues *realpolitik* and does not value moral/normative principles actually gets reinforced. As a result, decision makers should be realistic about what can be achieved through operational-level engagement.

On the issue of deep nuclear reduction, for instance, Chinese analysts agree that President Obama is more active in promoting nuclear arms control but believe that his initiative is primarily driven by calculations of interests.⁷³² As one puts it, “Obama’s ‘nuclear free world’ proposal, although objectively speaking has positive and progressive implications, is essentially a continuation of America’s political philosophy which pursues ‘absolute security’; it is due to Obama administration’s reassessment of the features of the security threats faced by the United States, and of America’s ability to protect its security; it is an important strategic measure to employ ‘smart power’ to pursue America’s ‘absolute security.’”⁷³³ Even for the Obama administration, which has taken very active steps to pursue deep nuclear reductions, it is difficult to convince China that the United States intends to break away from *realpolitik* thinking and to bring about substantial transformation of its nuclear relationship with China and other countries. If the United States indeed seeks to fundamentally change China’s perception on these issues, this might not be a goal that is achievable. At least operational-level engagement does not seem to be able to contribute.

⁷³²Sun, "New Challenges and New Agenda for China's Arms Control (中国军控的新挑战与新议程)."; Lu, "U.S.-China Arms Control Interaction and Its Theoretical Analysis (中美在军控领域的交流及其理论分析)."

⁷³³Wang, "On the United States' Political Theology of "Absolute Security" and Obama's "Nuclear-Free World" (论美国 “绝对安全” 神学政治与奥巴马 “无核世界思想”)."

With that said, there is strong evidence that operational-level engagement increases strategic trust. Both types of operational-level engagement—concentrated engagement and long-term engagement—help the two countries find new common interests and become more motivated to achieve these newly recognized common interests. Therefore, future engagement programs with China should focus more on promoting interest-based cooperation. More importantly, policy makers should not assume that common interests are something obvious. Various factors such as history, culture, bureaucratic habits, and lack of first-hand experience can all undermine the partner's ability to recognize the existence of common interests. Future dialogues and exchanges can focus more on addressing these potential obstacles.

According to the findings of this research, the increase of strategic trust is a direct result of the growth and expansion of the Chinese nuclear community. Policy makers who are responsible for managing operational-level engagement should recognize that helping China's nuclear community to grow and expand is an important and worthy goal in and of itself, even if the engagement programs do not generate immediate progress in the short term. Some U.S. participants of existing dialogues complain that when the Chinese delegation has new members on its team, these new Chinese participants tend to repeat the same arguments and views that had already been expressed in previous meetings.⁷³⁴ From the perspective of building China's nuclear community, it is actually beneficial to the United States for China to broaden the base of its participants in these dialogues. As more Chinese experts come to participate in these programs and start to engage with American colleagues, China's nuclear community grows. Policy makers should

⁷³⁴Personal correspondence with American participants of these programs, 2011, 2012.

encourage rotational participation in these dialogues and actively seek to bring new experts into these programs. In this regard, more Chinese military personnel should be encouraged to participate, because the number of Chinese participants from the PLA has so far been relatively small. Both countries should work together to reduce bureaucratic barriers for bringing additional Chinese military participants into the engagement programs.

Last but not least, the establishment of an appropriate risk-management mechanism in these exchange programs is important. Nuclear scientists are frequent participants of these programs and have greatly contributed to narrowing the gap between the two countries on important issues including CTBT, FMCT, and nuclear security. A certain level of information sharing has been proven necessary and very helpful for constructive dialogues. However, conservative politicians are always suspicious about such exchanges that involve technical experts and are extremely concerned about any potential release of sensitive information. In the case of the U.S.-China Arms Control Technical Exchange Program (also known as the U.S.-China Lab-to-Lab Technical Exchange Program), the United States set up an interagency oversight group consisting of officials from the State Department, DOD, DOE, National Security Council, Office of Science and Technology Policy, and Arms Control and Disarmament Agency to ensure that American scientists' interactions with their Chinese colleagues are carefully coordinated and do not reveal sensitive information.⁷³⁵ Even so, some U.S. Congressmen attacked this interaction for releasing sensitive information to the Chinese. Much to the opposition of many U.S. nuclear policy officials and nuclear scientists, the publication of the Cox Committee

⁷³⁵Prindle, "U.S.-China Lab-to-Lab Technical Exchange Program."

Report in 1999 essentially terminated the U.S.-China Arms Control Technical Exchange Program, and it has never resumed.⁷³⁶ The loss of potential opportunities as a result of the termination of this program cannot be fully evaluated. It serves as a reminder that technical exchange is an important part of U.S.-Chinese nuclear engagement, but security measures and oversight mechanisms should be emphasized to ensure that operational-level engagement can be effectively and continuously conducted without significant interruption in the future.

⁷³⁶Capua, "The Cox Report and the Us-China Arms Control Technical Exchange Program."

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